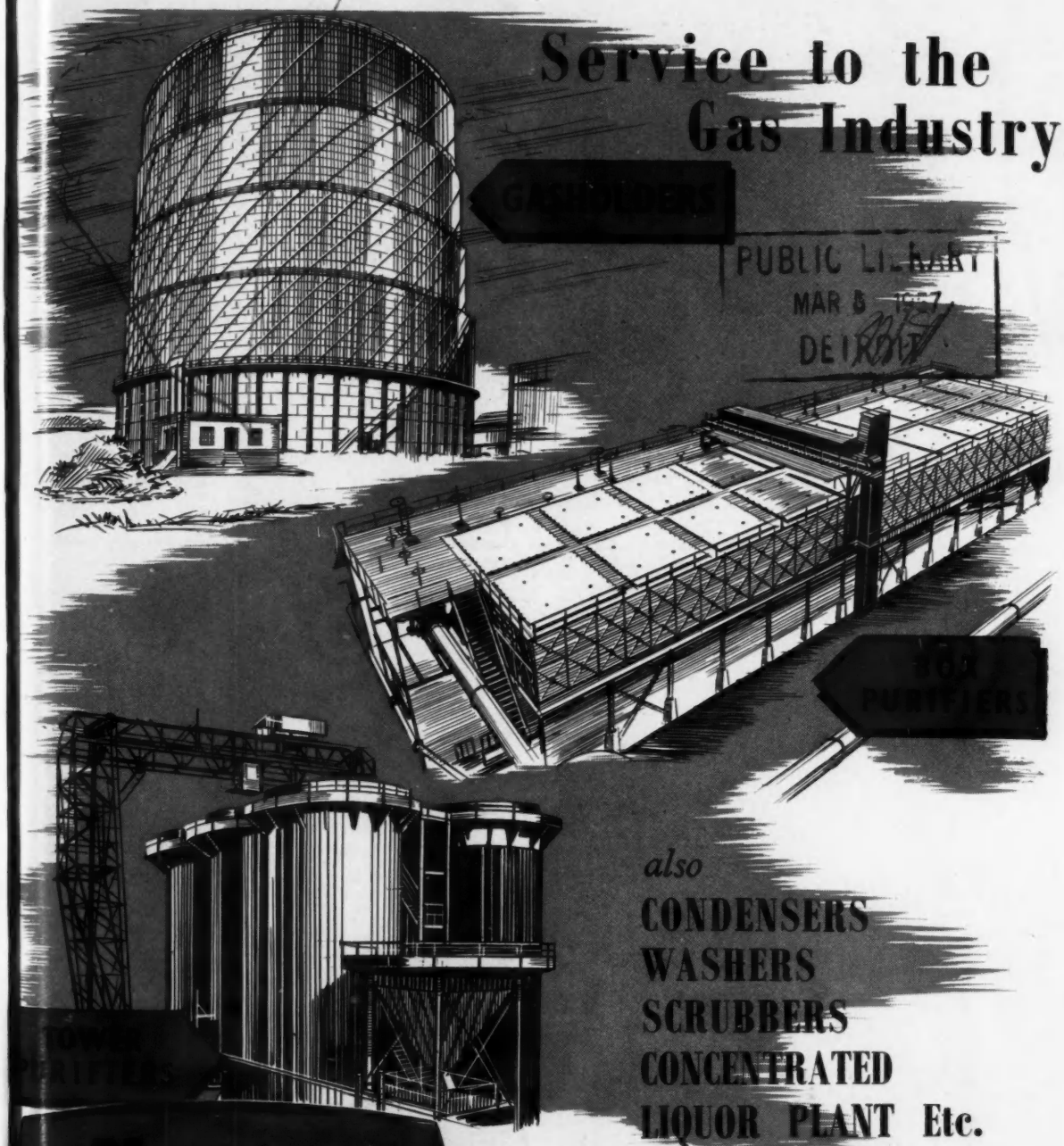
TECH: [illegible] DEPT.

Gas Journal

VOL. 289. 109th YEAR. LONDON, FEBRUARY 20, 1957. Nº 4884 PRICE 1/6



WHITLOCK

TWICE THE WORK . . . AT HALF THE COST

Dozalo

Can be used with a Dinkum Digger, Scraper, Compressor, or Dump Skip in position

★ Heavy-duty ¾ cu.yd. Power Shovel
★ Double-acting rams all round
★ High-speed operation by independent Pump
★ Finger tip control from tractor seat
★ Available with all-weather cab, Dozer blade, Crane Jib, Fork Lift

EASY TO FIT . . .
MOVES MORE . . .
COSTS LESS

WHITLOCK BROS LTD. GREAT YELDHAM ESSEX · Tel: GT. YELDHAM 305 (8 lines)

The

DONKIN HANSON AUTO-PILOT GOVERNOR

FOR USE WITH STATION GOVERNORS

THIS PILOT GOVERNOR IS OPERATED BY AN EIGHT-DAY CLOCK, AND CHANGES THE PRESSURE TO MEET PEAK LOADS, ACCORDING TO REQUIREMENTS. A DIFFERENT LINE CAN BE GIVEN FOR EACH DAY OF THE WEEK IF REQUIRED.

The **BRYAN DONKIN CO LTD** · Chesterfield

LONDON · MANCHESTER · MEMBERS OF THE SOCIETY OF BRITISH GAS INDUSTRIES

- THERMOSTATIC CONTROL
- FLAME FAILURE CONTROL SYSTEMS
- MAIN COCKS • JET COCKS
- NON FERROUS PIPE FITTINGS

SPERRYN & CO LTD.

MOORSOM STREET, BIRMINGHAM, 6.
PHONE: ASTON CROSS 4011 (5 LINES)
LONDON ADDRESS: 23, GT. SUFFOLK ST., S.E.1. PHONE: WATERLOO 6418

GEORGE GLOVER

DOMESTIC METERS
TEST METERS
INDUSTRIAL METERS
Product of Radiation Ltd

GAS METERS

122, KINGS RD. CHELSEA LONDON, S.W.3.
Branch works
WARRINGTON · LEEDS · MANCHESTER · CARDIFF.

& Co. Ltd.

Introducing

Designed for use in the building of Vertical Retorts, "THERMAX" bricks differ considerably from other clay-bonded siliceous materials by reason of their much higher bulk density with lower porosity and permeability. These improvements have been obtained by modification of composition and grading, by the development of a special pressing technique. A continuous and accurate control of the density is kept throughout the process. The result is a retort brick giving reduced slag erosion and flaking which permits retorts to be built and operated without joint leakages.

"THERMAX"

THE NEW CONTROLLED-DENSITY SILICEOUS RETORT BRICK

Full technical information will be forwarded gladly on request

DSF

DERBYSHIRE SILICA FIREBRICK CO. LTD
FRIDEN . HARTINGTON . NEAR BUXTON . DERBYSHIRE
GRAMS : SILICA, FRIDEN, HARTINGTON
PHONE : YOULGRAVE 271 (3 LINES)

NOW!

.. every coat *positively* rust-inhibiting !

BETTER PROTECTION..LONGER LIFE..LOWER UPKEEP COSTS!

These desirable features are now a reality for you!

Atlas now offers you a new range of Undercoats which not only give "build" to the ultimate paint film, but which are themselves positively rust-inhibiting! Their corrosion resistance has been proved by laboratory tests and prolonged exposure trials. Now, every coat . . . Primer, **UNDERCOAT** and Finish . . . is positively rust-inhibiting, each adding its quota to the formation of a tough, durable paint film!

● Send now for colour card and particulars of these money savers!

ATLAS RUSKILLA *The Paints of Stamina*

IRON & STEEL *PRESERVATIVE* PAINTS

ATLAS PRESERVATIVE CO. LTD., ERITH, KENT 'Phone: ERITH 2255 (3 lines) 'Grams: Deoxydizer, Erith

TAS/AS.157

ASHES Handling Plant

Comprising
SKIP HOIST and OVERHEAD STORAGE HOPPER
for a large
CONTINUOUS VERTICAL PLANT

Photograph published by courtesy of the North Western Gas Board.

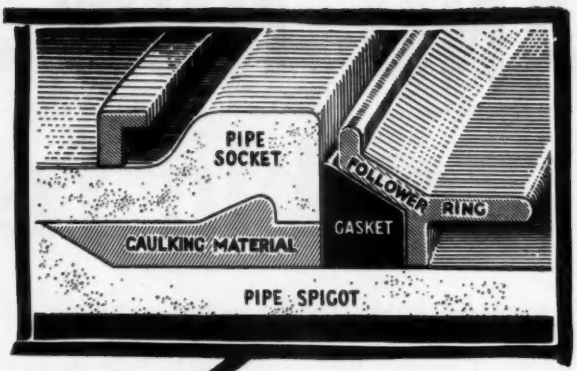
DRAKES of HALIFAX LTD

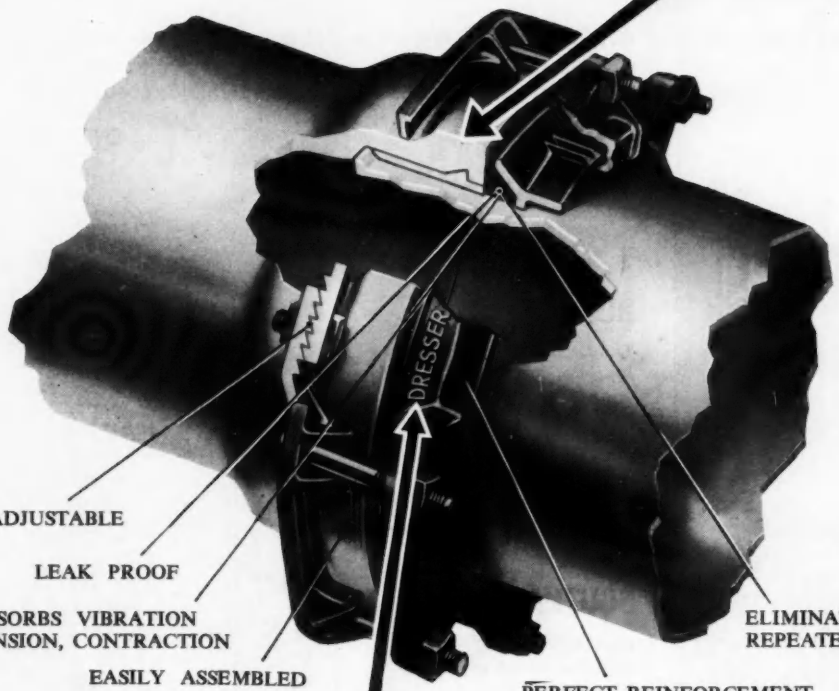
Telephone: Halifax 4701 P.B.Ex. Telegrams: Drakefax, Halifax.

CONSTRUCTIONAL GAS ENGINEERS FOR MORE THAN A CENTURY

J.J.M.

Why it's better to fit DRESSER STYLE 60 CLAMPS





ADJUSTABLE

LEAK PROOF

ABSORBS VIBRATION EXPANSION, CONTRACTION

EASILY ASSEMBLED

ELIMINATES NEED FOR REPEATED RECAULKING

PERFECT REINFORCEMENT

They're best all round!

Supplied in all sizes from 3 inch to 48 inch diameter for socket and spigot joints of British Standard Cast and Spun iron mains. Patterns available or can be designed for special joints of either steel or non-standard cast iron mains. Send for full information, also details of the Dresser 16 mm. instructional colour film "CLAMPING PROCEDURE" available on loan.

DRESSER

adjustable leak clamps

DRESSER MANUFACTURES (ENGLAND) LTD., 39, VICTORIA STREET, LONDON, S.W.1

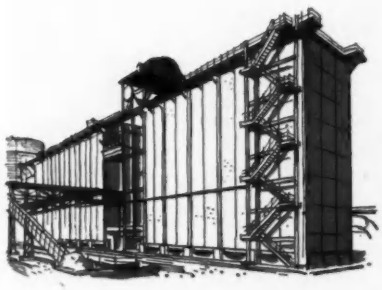
Telephone ; Abbey 5238 *Telegrams ; Dresclam, Sowest, London*

One of the **DRESSER** *Industries*

FWS

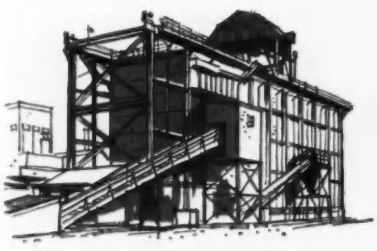
AND NOW 30,000,000 cubic feet PER DAY

Following on the success of the Balfour-Lecocq Tower Box Purifiers at Rotherham, Southall and Bow Common, Balfour are now building the largest of its kind at Beckton for the North Thames Gas Board. With an output of 30,000,000 cubic feet per day, the plant will be fully automatic and extremely economic in terms of running and maintenance costs.



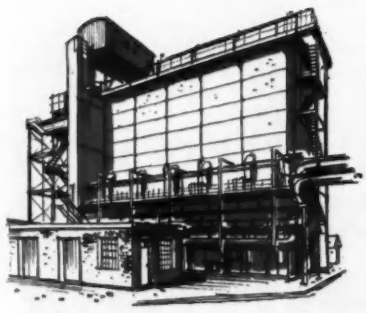
ROTHERHAM

This Balfour Tower Box Purifier is handling 20,000,000 cu. ft. of gas per day.



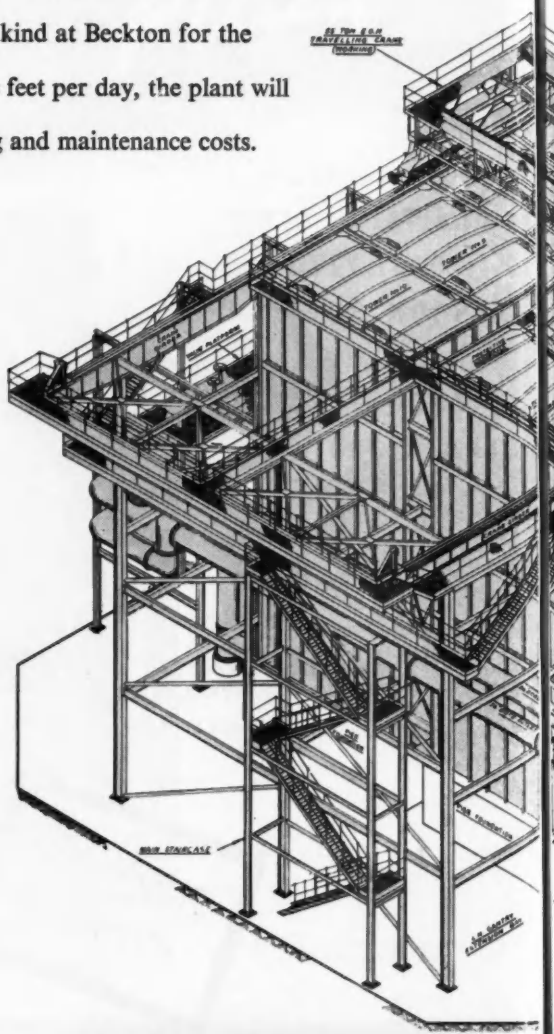
SOUTHALL

Another recent Balfour installation capable of handling 7,500,000 cu. ft. per day.



BOW COMMON

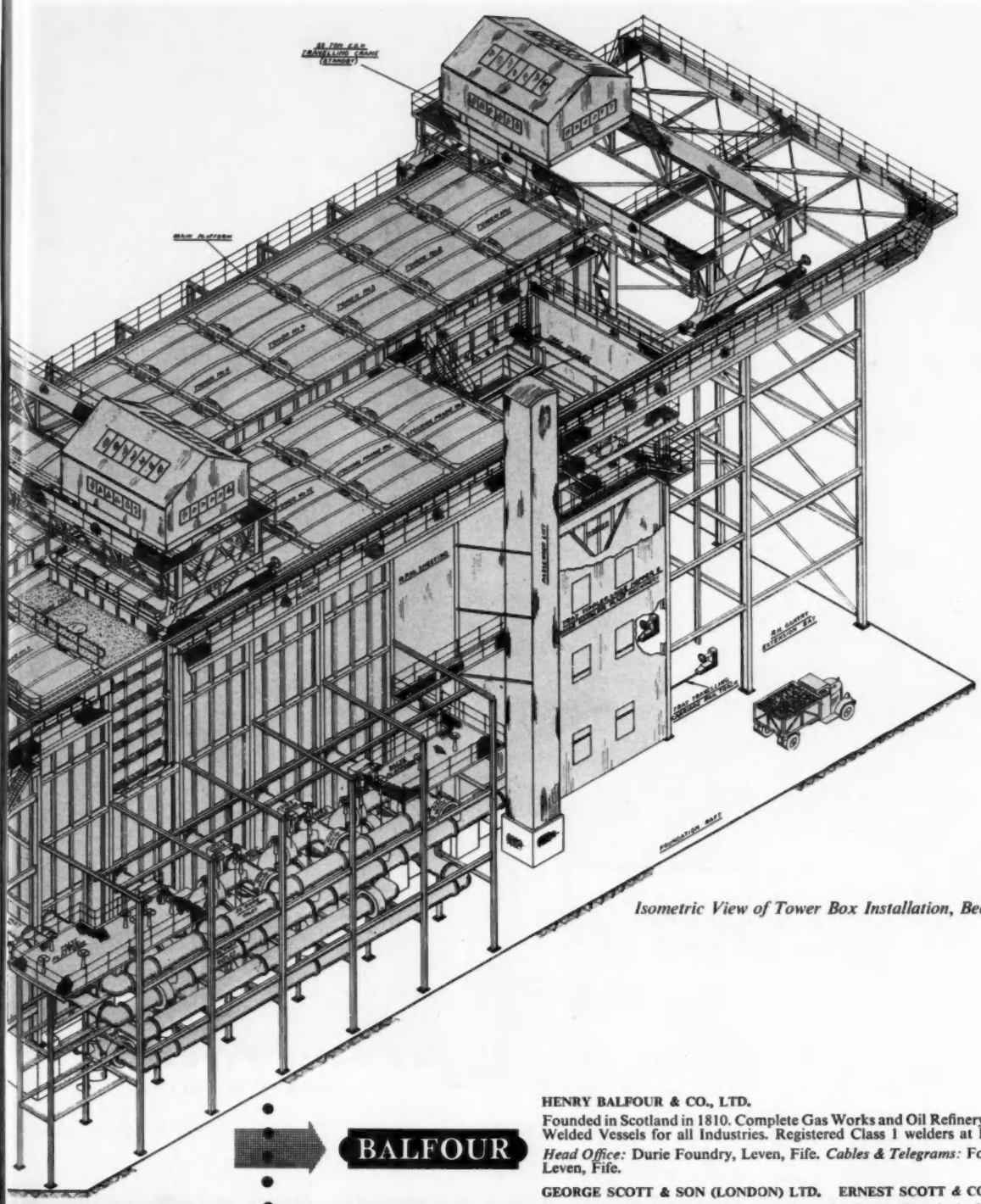
A recently completed installation of Balfour Tower Box Purifiers with a capacity of 4,000,000 cu. ft. of gas per day.



THE BALFOUR

BALFOUR GROUP LONDON OFFICES:
Artillery House, Artillery Row, Westminster, S.W.1.
Telephone: ABBey 2121
Agents in India, Pakistan, New Zealand & South Africa. Overseas Companies in Canada & Australia.

BALFOUR of Leven-the Gas Engineer



Isometric View of Tower Box Installation, Beckton.

BALFOUR

GROUP

SCOTT

Pfaudler

HENRY BALFOUR & CO., LTD.

Founded in Scotland in 1810. Complete Gas Works and Oil Refinery Plant. Welded Vessels for all Industries. Registered Class 1 welders at Lloyds.

Head Office: Durie Foundry, Leven, Fife. *Cables & Telegrams:* Foundry, Leven, Fife.

GEORGE SCOTT & SON (LONDON) LTD. ERNEST SCOTT & CO. LTD.

Founded in 1834. Complete Process Plant for Food, Chemicals, Plastics, Paints, etc. Scott can also engineer a complete process factory.

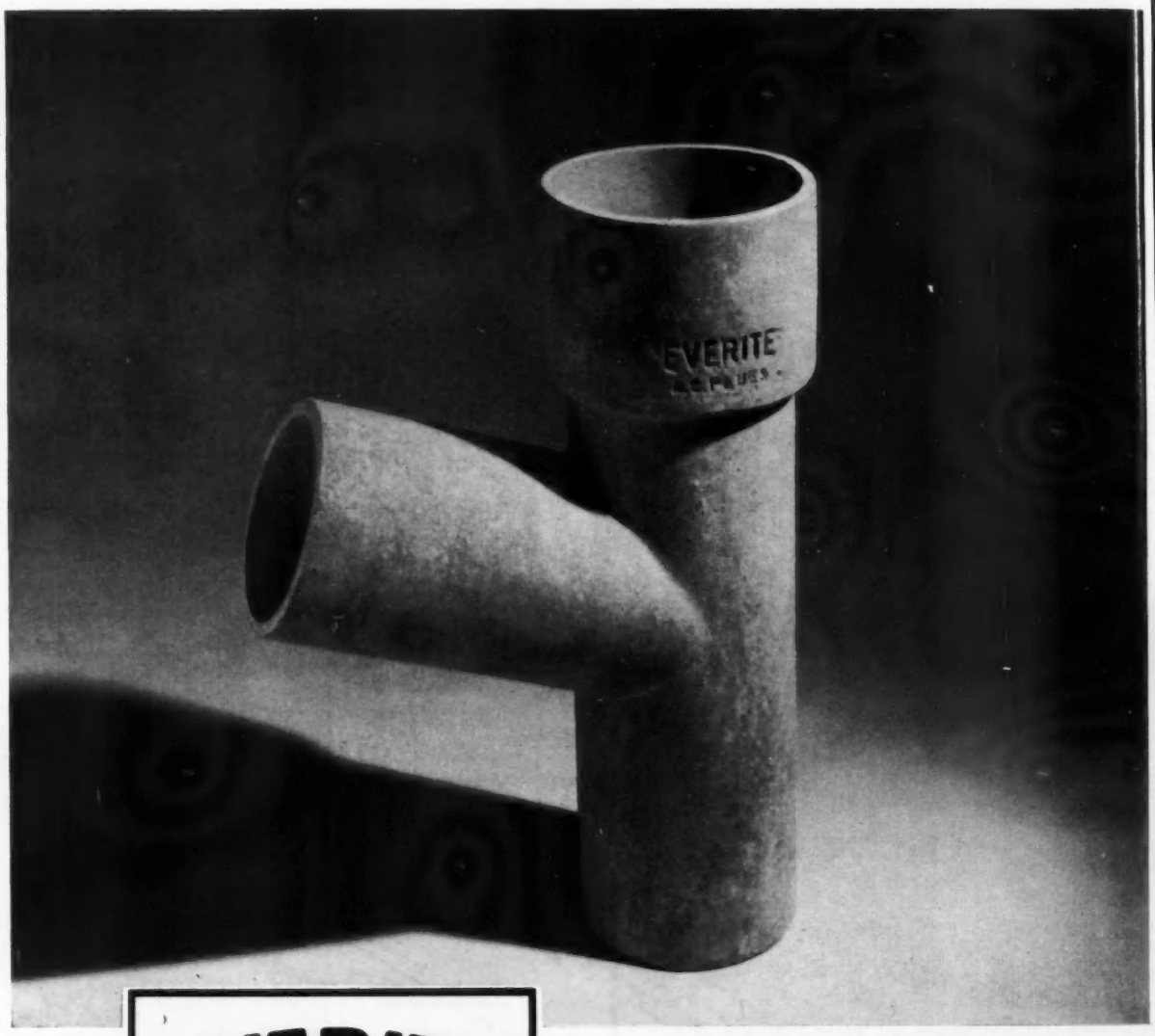
Head Office: Levenbank, Leven, Fife. *Cables & Telegrams:* Niobate, Leven, Fife.

ENAMELLED METAL PRODUCTS CORPORATION (1933) LTD.

Glass-enamelled steel storage and process vessels, transport tankers for Milk, Food, Brewing and Chemical Industries.

Head Office and Works: Durie Foundry, Leven, Fife. *Cables & Telegrams:* Pfaudler, Leven, Fife.

Partners of the Balfour Group



"EVERITE"
REGD. TRADE MARK

ASBESTOS CEMENT FLUE PIPES
(HEAVY QUALITY)

WE HAVE AN EXHIBIT AT THE BUILDING CENTRE
26 STORE STREET W.C.1

Pipes and fittings available in 3", 3½", 4", 4½", 5" and 6" diameters—also 7" to 12" diameters.

Suitable for use with slow combustion stoves and also for general industrial ducting work etc.

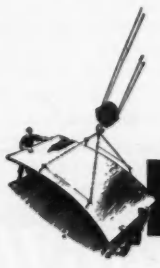
Manufactured in accordance with BS.835/1954.

TURNERS ASBESTOS CEMENT CO LTD
A MEMBER OF THE TURNER & NEWALL ORGANISATION
TRAFFORD PARK MANCHESTER 17

F10

WHESSOE —

AT AVENUE



WHESSOE

For the National Coal Board's new Avenue Carbonisation and Chemical Plant at Chesterfield, Whessoe received an order from the Woodall-Duckham Construction Co. Ltd. for the primary cooling plant (5 vertical water-tube coolers), the secondary cooling plant (2 vertical water-tube coolers), four W.W.-D. electro-detarrers and three benzole scrubbers (each 13′ 6″ in diameter and 106 ft. high). Included in the order were 2 vertical storage tanks (each 34 ft. in diameter) and 14 horizontal storage tanks (each 9 ft. in diameter and 25 ft. long). (Photograph by courtesy of the Woodall-Duckham Construction Co. Ltd.)

An advertisement of WHESSOE LIMITED Darlington and London

W. 91

THIS Nº 8 SCREW FIXED IN BRICK

In only 37 seconds!

This brick (a Fletton) was power-drilled with a Rawlplug Durium Drill, a Rawlplug inserted and the screw turned home—in 37 seconds! Brick hardness and working conditions vary too widely to generalize about such a test, but it is true to say that *always*, whatever the material and conditions, you can make fixings in a fraction of the time with Rawlplug Fixing Devices and Rawlplug Tools as compared with any other method. You'll get firmer, neater fixings too!

There's a Rawlplug for every size of screw up to ¾" diam. coach screws, and a complete range of hand and power boring tools—the finest you can buy.

Write for illustrated literature of Rawlplug Fixing Devices, and if you have a fixing problem, please give full details. Our Technical Service Dept. will be delighted to solve it for you—without charge.

RAWLPLUGS WALL PLUGS

Free—

NEW REVISED

RAWLBOLT reference chart

Your old R1144 standard reference chart is now obsolete, as the introduction of universal type shields has changed many of the dimensions of Rawlbolts. You will find the new revised chart, printed in colour, of immediate value for details of all sizes of Rawlbolts, depth and diameter of holes needed and sizes and types of tools available. Fill in the coupon *now* and have *your* copy sent you free and post free.

RAWLPLUG

IP 4346/137

THE RAWLPLUG COMPANY LTD.
CROMWELL ROAD • LONDON • S.W.7

To Dept. J.E.S. The Rawlplug Company, Ltd., Cromwell Road, London, S.W.7.

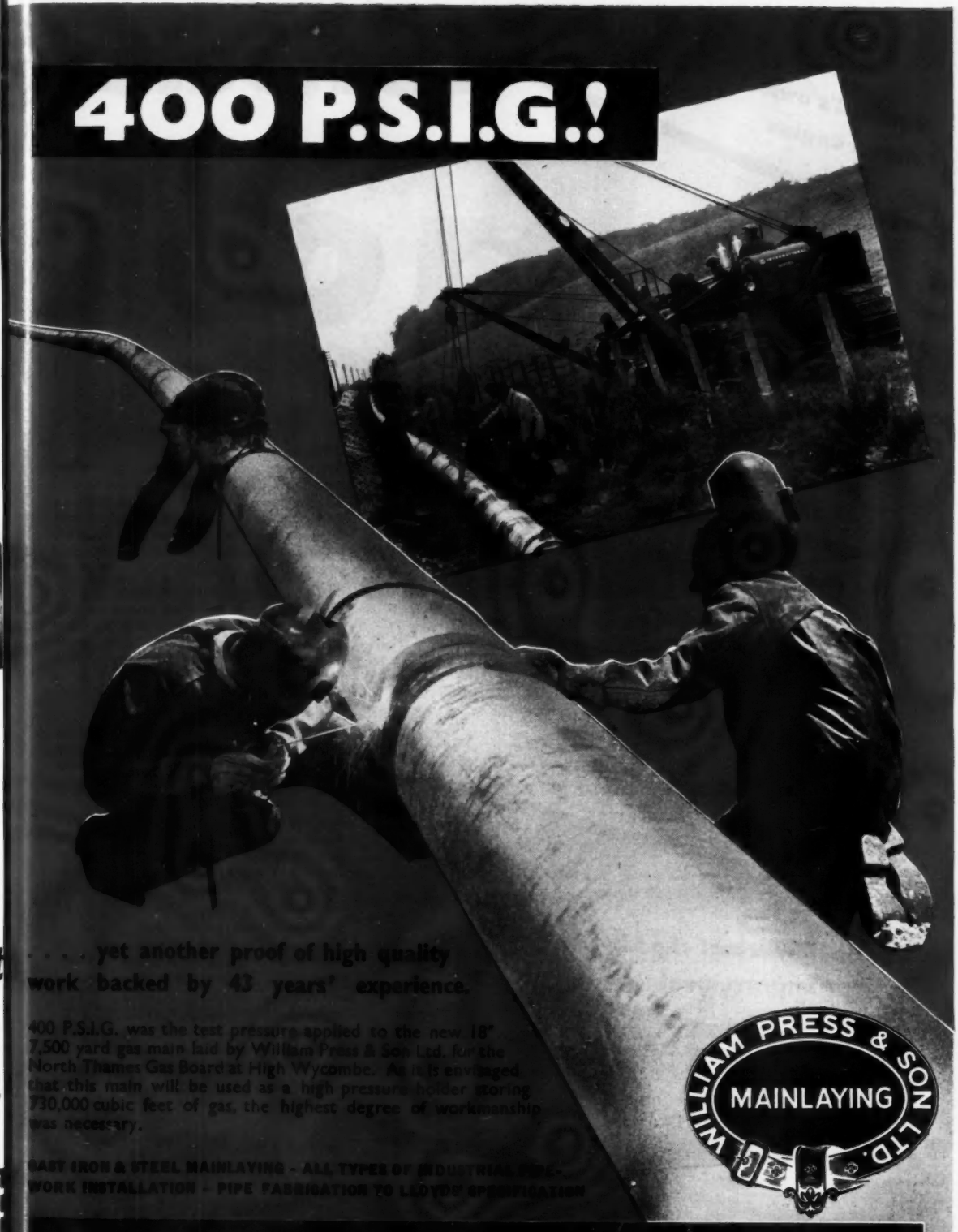
Please post me a copy of the completely revised edition of the Engineers' Rawlbolt Reference Chart (Publication No. R1144)

Business Name.....

Address.....(County).....

For the attention of.....

400 P.S.I.G.!



. . . . yet another proof of high quality work backed by 43 years' experience.

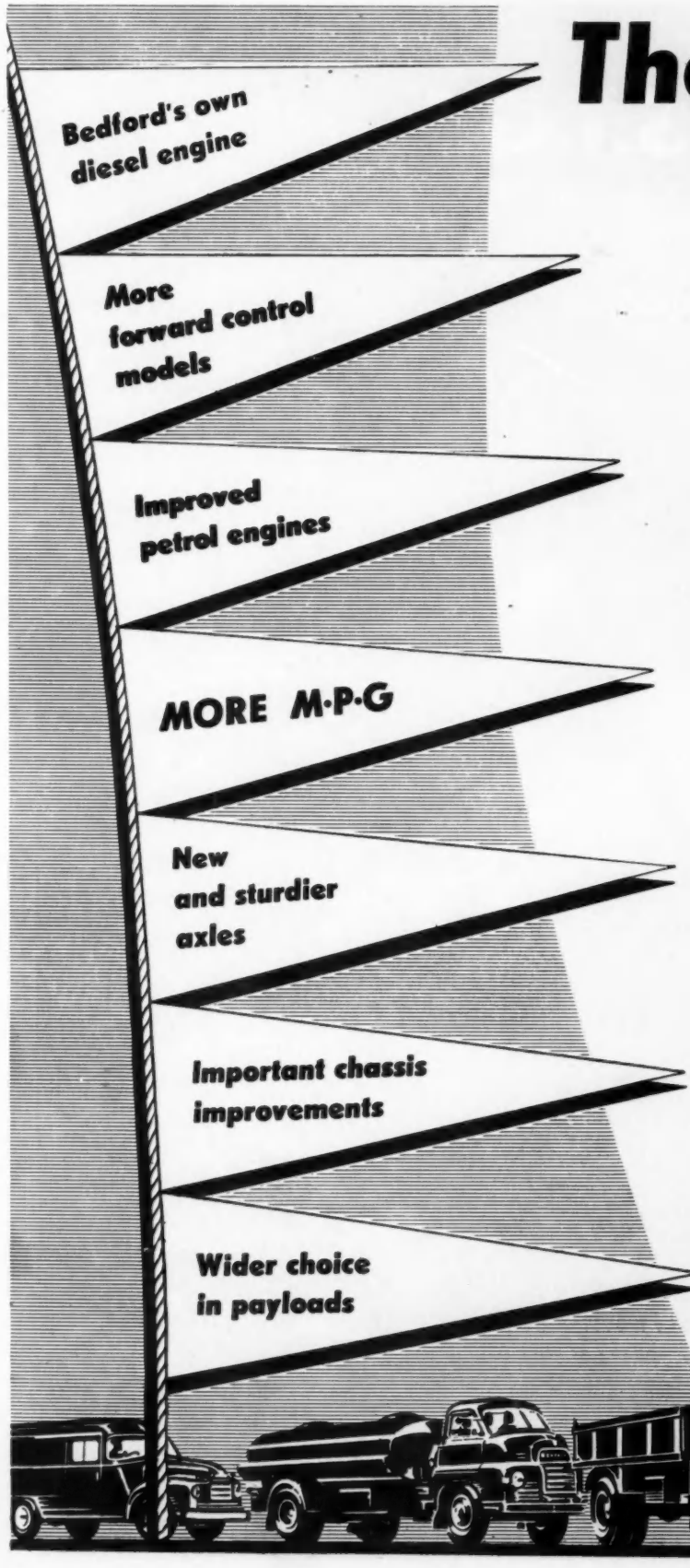
400 P.S.I.G. was the test pressure applied to the new 18" 7,500 yard gas main laid by William Press & Son Ltd. for the North Thames Gas Board at High Wycombe. As it is envisaged that this main will be used as a high pressure holder storing 730,000 cubic feet of gas, the highest degree of workmanship was necessary.

CAST IRON & STEEL MAINLAYING - ALL TYPES OF INDUSTRIAL PIPE-WORK INSTALLATION - PIPE FABRICATION TO LLOYDS' SPECIFICATION

WILLIAM PRESS & SON LTD. MAINLAYING

William Press and Son Ltd.

22, Queen Anne's Gate, Westminster, London, S.W.1. Tel.: Whitehall 9731 (7 lines). 'Grams': UNWATER, PARL, LONDON. Willoughby Lane, Tottenham, N.17. Telephone: TOTtenham 3050 (12 lines). Telegrams: UNWATER, SOUTHTOT, LONDON.



The better-

Be

Bedford's own diesel engine
After many years spent designing, perfecting and testing, Bedford introduces its own diesel engine. 97 b.h.p. . . . six-cylinders . . . direct injection . . . cold rolled crankshaft fillets and other unmatched long-life features. Bedford presents diesel fuel economy at its latest and best.

New forward control middleweights
New Bedford 4-ton, 5-ton and 6-ton forward control trucks give maximum body space in minimum overall length, small turning circles and real manœuvrability. 14 ft. bodies for 4 and 5-tonners; 14 or 16 ft. bodies for 6-tonners.

Improved petrol engines
More efficient and *more economical* power is provided by Bedford's improved, high compression petrol engine for all middleweight models. Many extra long-life features for the Big Bedford petrol engine.

New and sturdier axles
All models from 4-ton upwards have the new Bedford 17,000 lb. rated rear axle . . . four times stronger in shock resistance; larger diameter shafts, four pinion differential.

Important chassis improvements
New telescopic shock absorbers are now fitted to all Bedford front springs. Many other extra life improvements to chassis and cabs.

Wider choice of payloads
Normal or forward control, petrol or diesel power, the Bedford range covers every load from 10 cwt. to 10 tons in logical, carefully graded stages.

Vauxhall Motors Ltd., Luton.

er-than-ever

edfords

have arrived!

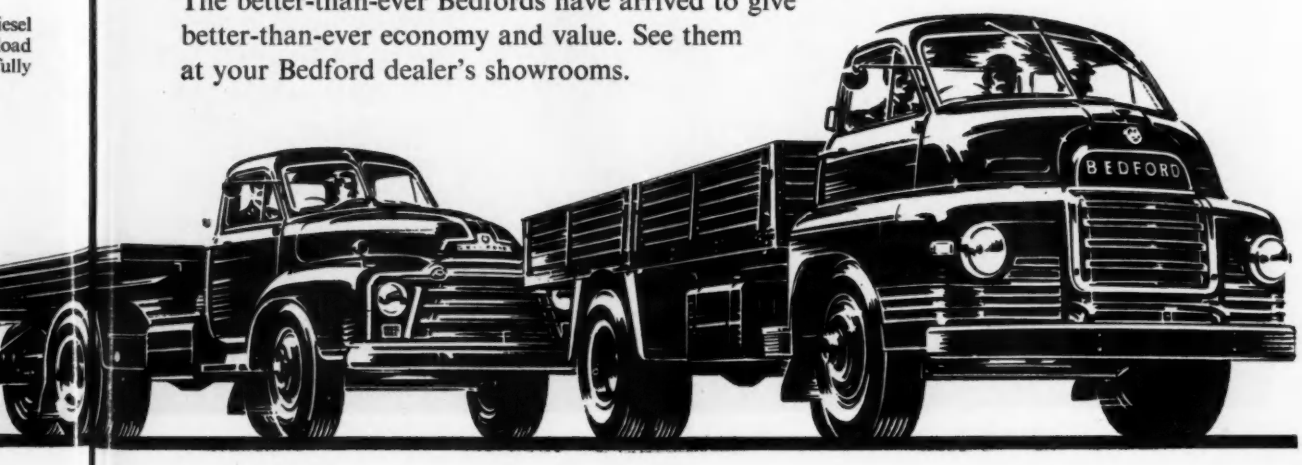
Now! Bedford's own diesel engine

Now! More forward control models

Great news for all truck operators. Important improvements to every single truck in the Bedford range . . . many new models to make the Bedford range more comprehensive than ever . . . and, at a time when fuel economy is uppermost in the minds of transport operators everywhere, *Bedford offers its own diesel engine*. This new direct injection diesel gives *outstanding fuel economy*, and is priced lower than any other 6-cylinder diesel. Extra fuel economy is also the big feature of Bedford's higher compression, improved petrol engine.

Now, too, Bedford introduces new forward control middleweight models plus the latest Bedford advances in axle, suspension and cab design.

The better-than-ever Bedfords have arrived to give better-than-ever economy and value. See them at your Bedford dealer's showrooms.



matchless service in the kitchen

★

NEWBRIDGE
Mk. III
GAS PISTOL

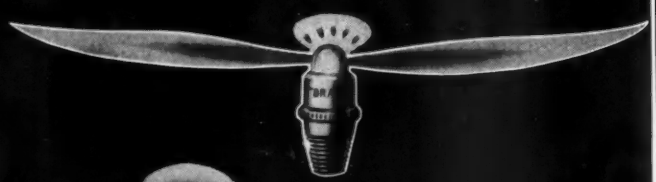
A squeeze of the trigger brings a light for the gas cooker. Always at hand and always instant action. This latest, chrome finished lighter embodies the fine workmanship characteristic of all Newbridge appliances, and is rapidly proving to be the most popular gas cooker lighter on the market.

For further details write to:

THE HORSTMANN GEAR CO. LTD · NEWBRIDGE WORKS · BATH.

BRAY
NEAT GAS JETS

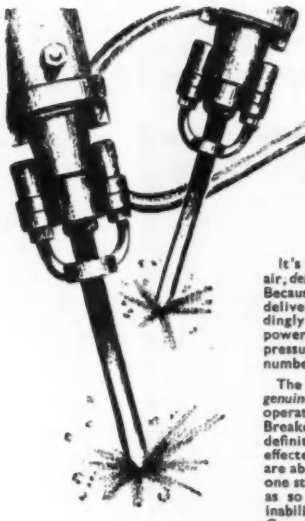
NON-ATMOSPHERIC AND
ATMOSPHERIC TYPES



for COAL GAS
ACETYLENE
BUTANE · PROPANE
NATURAL GAS
METHANE Etc.

GEO. BRAY AND CO., LTD. LEICESTER PLACE, LEEDS 2
Tel. Leeds 20981 9 Grams. "Bray Leeds 2"

At all these branches
George Wilson Gas Meters Ltd
produce Meters
to meet your
every need
Jarrow
Manchester
Wolverhampton
Coventry
Cardiff
London



More power–less cost

It's the volume and pressure of the air, *delivered to the tools* that counts. Because "BRISTOL" Compressors deliver cooler air, with a correspondingly higher volume for the same power, they are able to maintain the pressure required to operate the full number of tools efficiently.

The "BRISTOL" Model '139' is a *genuine* two-tool Plant which will operate two heavy duty Road Breakers *simultaneously* for an indefinite period. Great economy is effected by the fact that two operators are able to work together instead of one standing idle watching the other, as so often is the case, due to the inability of their so-called "two-tool" Compressor to maintain the necessary pressure.

Cooler air means a greater volume for the same horse-power, which in turn means fuel economy—that is *cheaper air!*

Before you buy air compressors for any duty ask us to prove these claims! Write for Catalogue No. 86.

The photograph of the "BRISTOL" Model ATS/139/PD2 2-Tool Plant (F.A.D. 120 CFM) in action in Bristol's city centre is reproduced by courtesy of the City Engineer of the City and County of Bristol.

PNEUMATIC BRISTOL TOOLS LTD

AIR COMPRESSORS

COOLER AIR IS CHEAPER AIR

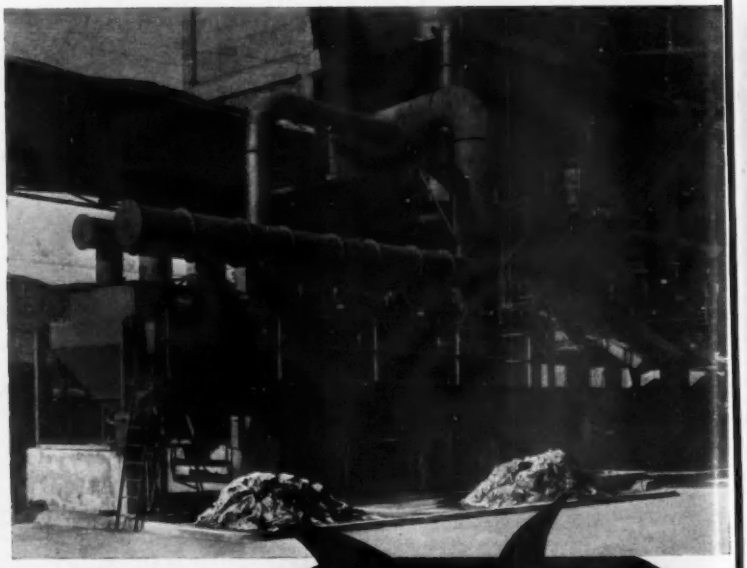
BRISTOL PNEUMATIC TOOLS LTD · FISHPONDS · BRISTOL · Telephone: Bristol 65-3264*

dm BT18

DUST & FUME EXTRACTION

DRUMMOND plants are satisfactorily dealing with dusts and fumes from boilers, furnaces, cupolas, converters, coke and coal handling, shot blasting, foundries, grinding, polishing, plating, paint manufacture and spray painting.

Instead of enormous clouds of dust, the particles are converted into a wetted cake that can never rise again to become a nuisance.



THESE HEAPS, each one a day's accumulation, represent a dense cloud of between ten and twenty million cubic feet of air.

We will gladly discuss your requirements with you.

DRUMMOND PATENTS LTD.

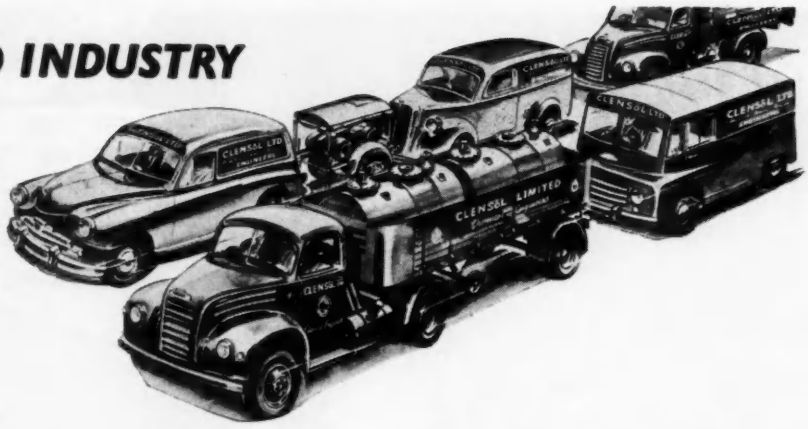
5, GREAT WINCHESTER STREET, LONDON WALL, LONDON, E.C.2.

Telephone: LONDON WALL 4432 & 2626

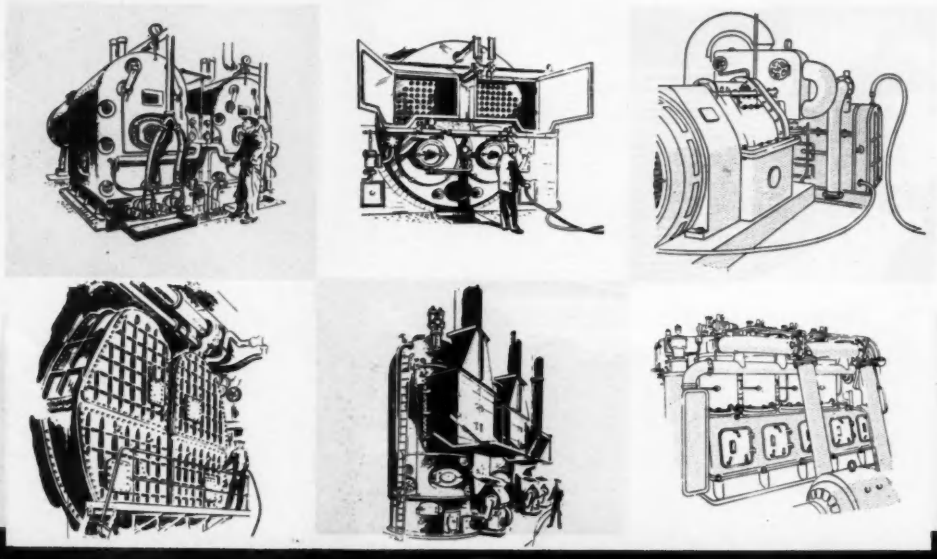
Northern 141, Royal Exchange, Cross Street, Manchester, 2. Telephone: Deansgate 7015

Offices: Market Chambers, New Market Street, Newcastle-upon-Tyne, 1. Telephone: Newcastle 2/3837

SERVICE TO INDUSTRY



TO KEEP YOUR PLANT 'CLENSŌL-CLEAN'



CLENSŌL

DE-RUSTING • DE-SCALING DE-GREASING and WATER TREATMENT SERVICES

Contractors to The Admiralty — War Dept. — Air Ministry — Ministry of Supply, Works & Transport—U.K. Atomic Energy Commission—Central Electricity Authority—Gas, Coal & Hospital Boards—Local and Water Authorities—the leading shipping, oil and industrial firms.
Approved by the majority of the boiler, process, refinery, production and associated plant manufacturers, insurance companies etc.

CLENSŌL—SERVICE TO INDUSTRY

CLENSŌL specialist services are available "round-the-clock" for the speedy and efficient removal of deposits from all types of plant, pipework, supply and discharge mains etc., including "in situ" removal of corrosion products, mill scale from new plant, following installation. All work is carried out by fully qualified and mobile teams under the supervision of Area Engineers. CLENSŌL materials are the result of 30 years of continuous specialised research, into practical and technically efficient methods of application for the 'pre-service' or routine removal of:— rust, mill and mineral scale, grease, oil, tar, beer and milk stone gel, sugar and effluent deposits, etc.

Our Technical Representatives are "on call" at all times for free survey and discussion — throughout the British Isles and Overseas.

CLENSOL · DESCALING · DERUSTING · DEGREASING · WATER TREATMENT SERVICES

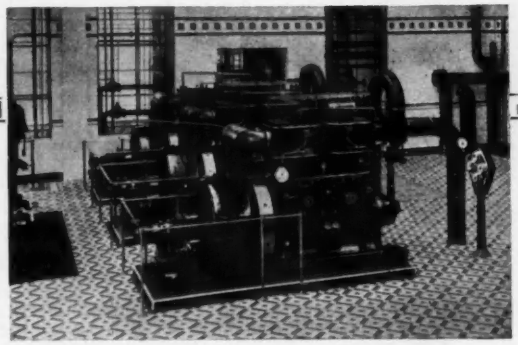
HEAD OFFICE—40 BERKELEY SQUARE, W.1
'phones: HYDE PARK 4521-2-3
'grams: CLENSOPIPE, WESO, LONDON

Depots at—London, Manchester, Bristol, Birmingham, Cardiff, Glasgow, Hull, Belfast. *Represented throughout most overseas territories.*

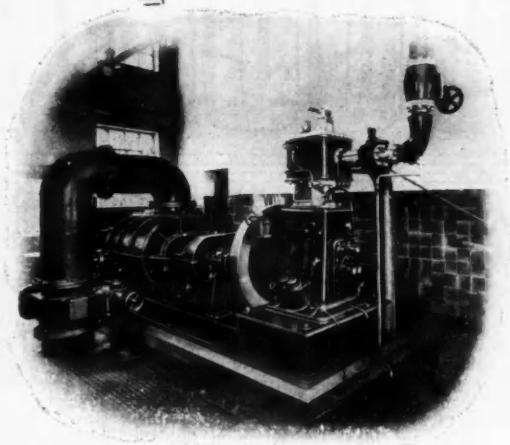
Norfolk for Dumplings
. . but
STAVELEY
Traditional foods, like traditional skills must always have a geographical centre. Norfolk's fame for its Dumplings is richly deserved and Cast Iron Pipes and Staveley are as world famous as they are synonymous.
for SAND & METAL SPUN PIPES
(with run-lead or flexible joints)
for GAS MAINS
THE STAVELEY IRON & CHEMICAL CO., LTD. Nr. CHESTERFIELD

Performance is the test

One Gas Works has placed five repeat orders for PARKER Engines since the first one was installed. Another has given four repeat orders. Still another has placed three orders for PARKER Engines.



PARKER Pass-Out Steam Engines Driving Electric Generators at a Gas Works



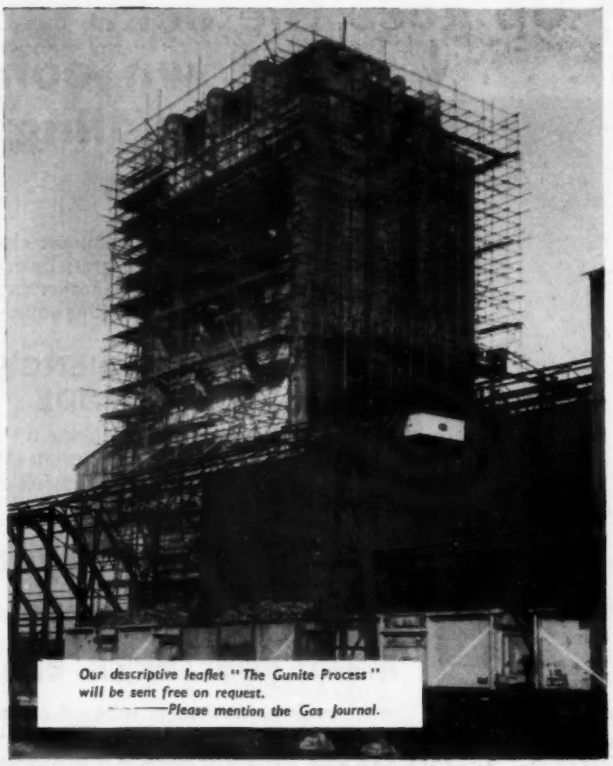
PARKER Engine Driving Holmes-Connersville Exhauster as supplied to Stretford, Leeds, Watford, Blackpool, St. Albans, Stockport, Corby, etc., etc.

By utilising the cheap steam available from your waste heat or breeze fired boilers you can obtain your power at almost negligible cost.

ASHWORTH & PARKER Limited

RIVERSIDE WORKS · BURY · LANCS. *Telegrams : "KINETIC," Bury. Telephone : 620/1.*

W.T.1797



Our descriptive leaflet "The Gunite Process" will be sent free on request.
Please mention the Gas Journal.

GUNITE Repairs To Reinforced Concrete Coal Bunker

This bunker structure at Gartsherrie Iron Works, Coatbridge, Scotland, is approximately 60ft. by 60ft. by 120ft. high. As with similar structures built with ½" cover, the thickness of the concrete on the reinforcement was found to be inadequate. Accordingly we applied an additional 2" thickness of reinforced gunite to the whole exterior, the work being executed without interfering with production.

We have specialised in the reconditioning of structures for more than twenty years. It is our practice to make a systematic diagnosis of each individual case, since only in this way can the correct treatment be determined to provide a permanent repair.

Employing Authority : BAIRDS & SCOTTISH STEEL LIMITED

WHITLEY MORAN AND COMPANY LIMITED

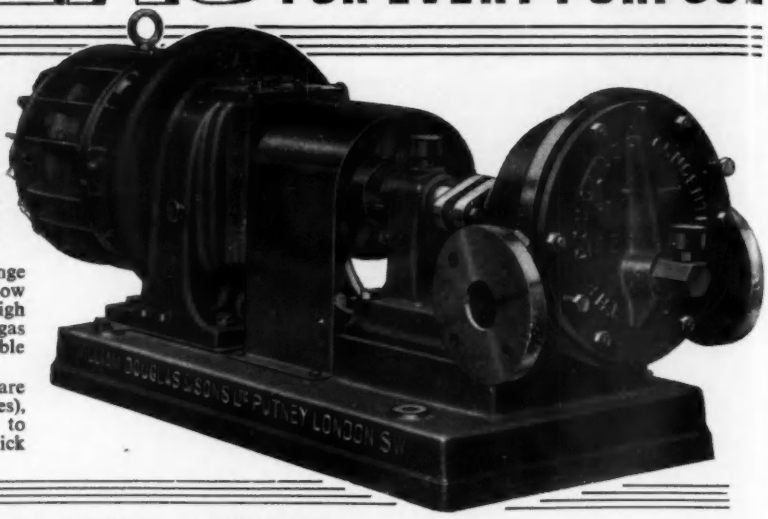
Specialists in the Repair of Engineering Structures

5 OLD HALL STREET, LIVERPOOL, 3

Tel.: CENTRAL 7975/6. Grams.: GUNITE, L'POOL, 3

DOUGLAS PUMPS FOR EVERY PURPOSE

*Slow Speed *Positive Action
*Powerful Suction *Robust Design



There is a Douglas Pump for your need be it Transfer or Handling of Oils, Gas Works Tar, Ammoniacal Liquor, Benzole or any other Viscous or Volatile Fluids encountered in gas works.

Douglas Pumps will operate over a wide range of temperatures and because of their slow speeds are ideal for pumping fluids of high viscosity. They will pump vapours without gas locking which makes them also highly suitable for volatile fluids.

Additional advantages of Douglas Pumps are smooth flowing action (essential for volatiles), slow movement giving long life, ability to reverse direction of flow, and no valves to stick up. Capacities: 200—5,000 g.p.h.

WILLIAM DOUGLAS & SONS LIMITED
DOUGLAS WHARF, PUTNEY, LONDON, S.W.15. Telephone : PUTney 8181

↑ Up goes the coke . . . . . ↓ and down come the handling costs

This T. & T. installation is a bucket elevator feeding fuel to a coke-fired grass drier on a Lincolnshire farm, and is just another example of the versatility of T. & T. handling equipment.

T. & T. EXPERIENCE IS WORLD-WIDE

T. & T.'s many years' experience on many hundreds of large and small installations at home and abroad is your assurance of satisfaction.

T. & T. Conveyors and Elevators make your work easier

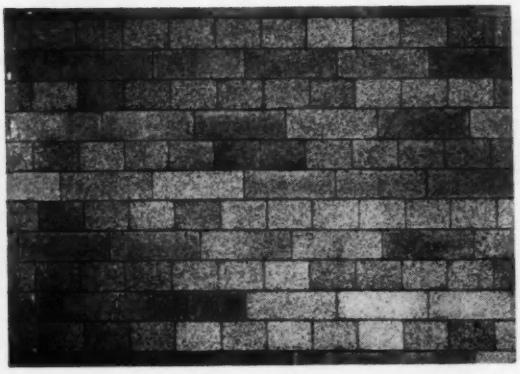
Photograph reproduced by courtesy of Glentworth Scottish Farms, Ltd.

Write for leaflet G.J., or ask for technical representative to call and discuss your requirements without obligation

T. & T. WORKS LTD., BILLESDON, LEICESTER

Tel.: Billesdon 261 Grams: "Conveyor", Leicester
London Office :
39 Windsor House, 46 Victoria Street, S.W.1
Telephone :, ABBey 6085

STEIN Refractories

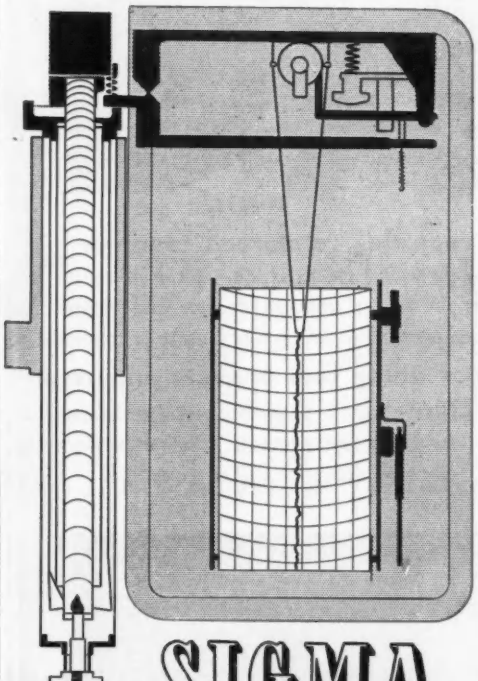


THE STRENGTH OF FURNACE BRICKWORK—and durability of the furnace lining in service is greatly controlled by the joints. Well shaped bricks of accurate size, use of a Refractory Cement correctly chosen for the purpose, combined with good bricklaying (which means thin, tight joints) gets a furnace lining off to a good start. A Refractory Cement should be selected just as carefully as the brick with which it is to be used. We are always very willing to give our advice on the best type of Cement for particular applications.

MAKSICCAR FIRE CEMENT · MAKSICCAR II · NETTLE CEMENT · STEIN SILLIMANITE CEMENT · STEIN HIGH ALUMINA CEMENT · STEIN CHROME CEMENT · STEIN CHROME-MAGNESITE CEMENT · STEIN MAGNESITE CEMENT · BLUEBELL SILICA CEMENT · THISTLE AND STEIN FIRECLAYS · GROUND GANISTER

JOHN G. STEIN & Co LTD Bonnybridge, Scotland

TEL: BANKNOCK 255 (4 LINES)

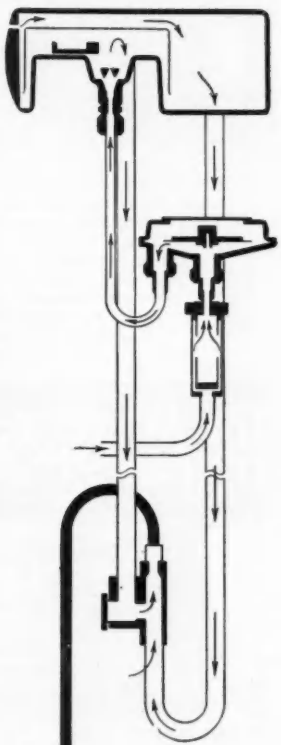


Why you should install the

SIGMA Recording Calorimeter MARK II

Incorporating all the improvements of modern instrument technique and recent scientific development, this SIGMA calorimeter will give a highly accurate reading of the calorific value of any combustible gas. It is not affected by normal changes in temperature and barometric pressures and gives a rapid response to change in C.V.

Extras supplied if required :—Automatic Control of C.V., Telemetering, Warning Lights, etc., etc. If you are interested in reliability, minimum maintenance, low cost—ask for full information NOW!



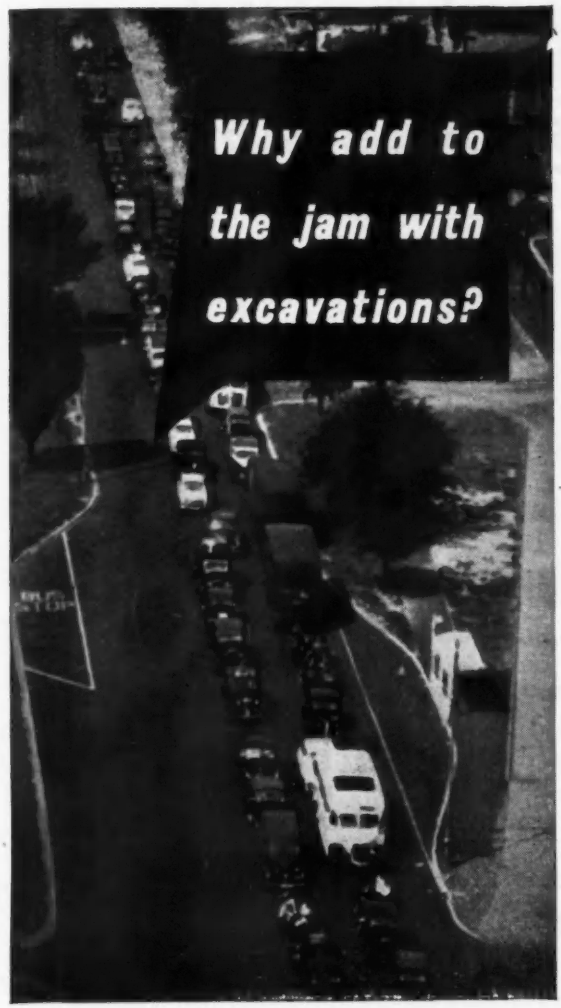
SIGMA
INSTRUMENT CO. LIMITED

Instrument Makers for the Gas and Allied Industries 1920 to 1956

SPRING ROAD · LETCHWORTH · HERTFORDSHIRE

Telephone : Letchworth 1845 (3 lines) *Telegrams : SIGMA Letchworth*

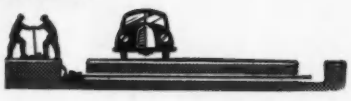
FWS



As the volume of traffic increases year by year, excavations on the roads become steadily more costly and inconvenient. They can be minimised by using the Pass Hydraulic Thrust Boring Machine for Underground pipe and cable installations. The machine offers a choice of four speeds and can be hand or power operated. Write for illustrated and detailed leaflet.

PASS
GAS AND WATER ENGINEERS

HYDRAULIC THRUST BORING MACHINE



Specialists IN UNDERPRESSURE ENGINEERING

E. PASS & CO. LTD., DENTON, MANCHESTER

Tel: Denton 3001/2/3 Grams: "Tools", Denton, Manchester.

dm PA 83

Gunite

One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

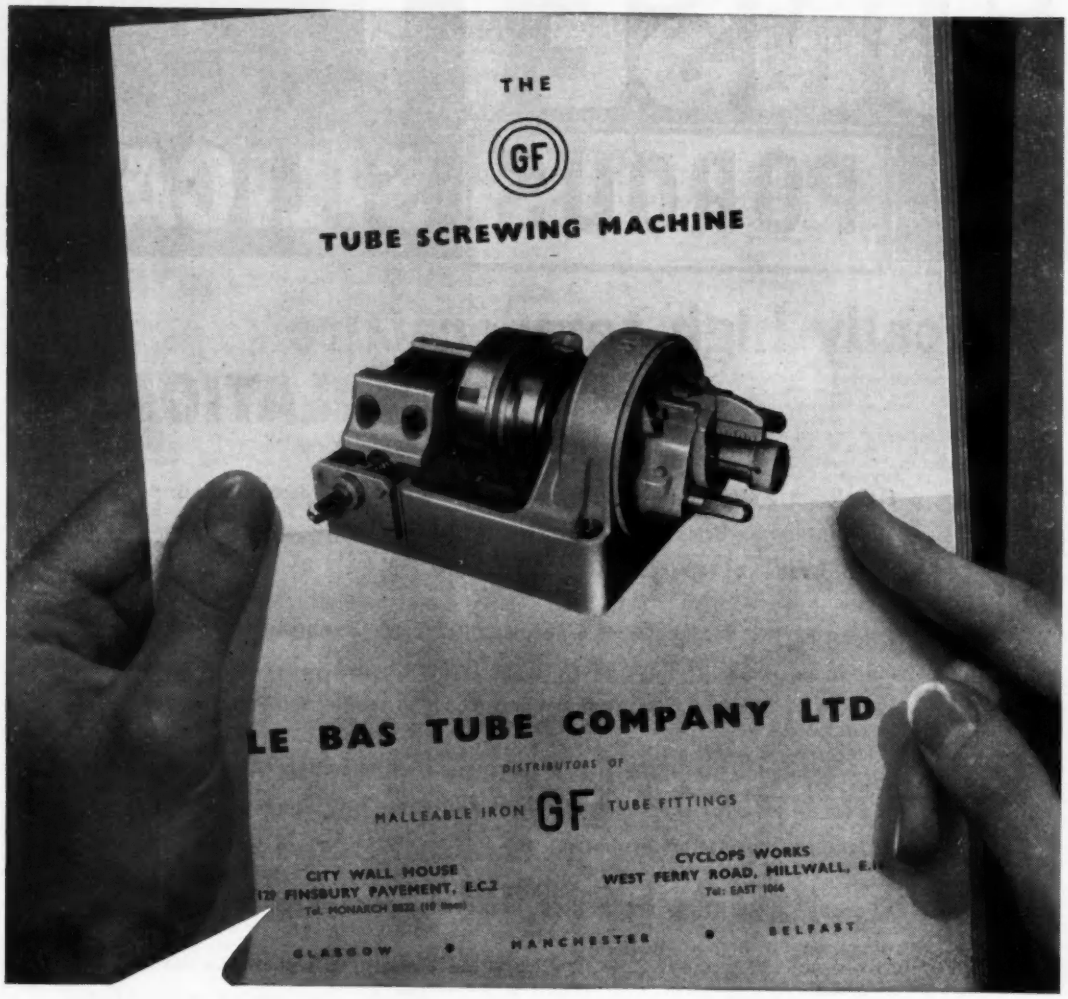
For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

96, VICTORIA STREET, S.W.1

Telephone : Victoria 7877 & 6275

THE CONCRETE PROOFING CO., LTD.

Handbook "GUNITE" sent on request



This will tell you how to cut the cost of screwing **perfect** pipe threads **on the site** or in your workshop

★ *Send for it today and ask us for a free demonstration*

LE BAS TUBE COMPANY LIMITED

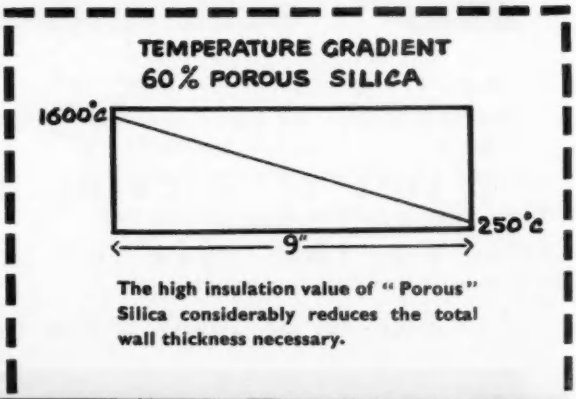
CITY WALL HOUSE · 129 FINSBURY PAVEMENT · LONDON · E.C.2
Telephone: MONarch 8822 · Telegrams: Lebasco, Avenue, London
LONDON · MANCHESTER · GLASGOW · BELFAST

CONSETT POROUS SILICA

A really high-temperature INSULATION...

- Developed and manufactured by the Consett Iron Company Limited, "Porous" Silica Insulating Bricks have become established as an important addition to the existing range of refractories.
- Possessing the advantages of a normal silica brick combined with high thermal efficiency, "Porous" Silica offers to the furnace builder a spalling resistant silica refractory suitable for hot-face insulation at high temperatures.
- Already in wide use in the glass industry for roof insulation "Porous" Silica Brick is also suitable for the construction of kiln roofs and side walls where its light weight and insulating properties are important factors in design and service.
- "Porous" Silica Bricks are made in two grades, 60% and 50% porosity, the latter possessing a higher mechanical strength, rendering it the most suitable for constructional work.

Further information will be gladly supplied on request.



The high insulation value of "Porous" Silica considerably reduces the total wall thickness necessary.

CONSETT IRON CO.
LIMITED
CONSETT · CO. DURHAM · ENGLAND

Telephone: Consett 341 (12 lines) **Telegrams: STEEL PHONE, Consett.**

INDEX TO 'JOURNAL' ADVERTISERS

	Page
A	
A.C.3. Machinery Ltd.	
A.P.V. Company Ltd.	
Abbott, Birks & Co. Ltd.	
Acme Wringers Ltd.	
Aerzen Co. Ltd.	
Alder & Mackay Ltd.	
Allan Taylor (Engineers) Ltd.	
Ascot Gas Water Heaters Ltd.	
Ashmore, Benson, Pease & Co.	Cover IV
Ashworth & Parker Ltd.	389
Aspinall's (Paints) Ltd.	
Associated Lead Manufacturers Ltd.	
Atlas Preservative Co. Ltd.	373
Audley Engineering Co. Ltd.	
Automotive Products Ltd.	
Averill, C. R., Ltd.	
B	
Bale & Church Ltd.	425
Balfour, Henry, & Co. Ltd.	376, 377
Berry's Foundry (1949) Ltd.	
Birtley Engineering Ltd.	
Blakeley, Firth, Sons & Co. Ltd.	
Bolton's Superheater & Pipe Works Ltd.	
Brant Colbran Ltd.	384
Bray, George, & Co. Ltd.	386
Bristol Pneumatic Tools Ltd.	
British Carbo-Norit Union Ltd.	
British Gas Purifying Materials Co.	425
British Jeffrey-Diamond Ltd.	
British Paints Ltd.	
British Rototherm Co. Ltd.	
British Thomson Houston Ltd.	
British Tyre & Rubber Co. Ltd.	
British Vacuum Cleaner & Engineering Co. Ltd.	
Broadbent, Thomas, & Sons Ltd.	
Broom & Wade Ltd.	
Brown, J., & Co. Ltd.	
Bugden, Thos., & Co.	
C	
Cambridge Instrument Co. Ltd.	
Cannon (G.A.) Ltd.	
Causeway Reinforcement Ltd.	
Cementation Co. Ltd.	423
Chemical Engineering Wiltons Ltd.	
Cinema-Television Ltd.	
Clapham Bros. Ltd.	
Clayton, Son & Co. Ltd.	
Cleckheaton Engineering Co. Ltd.	425
Clensol Ltd.	387
Clifford Engineering Co. Ltd.	
Cochrane (Middlesbro') Foundry Ltd.	
Cohen, George, Sons & Co. Ltd.	
Concrete Proofing Co. Ltd.	392
Consett Iron Co. Ltd.	394
Cort, Robert, & Son Ltd.	
County Chemical Co., Ltd.	424
Crane Ltd.	424
Crone & Taylor Ltd.	
Crosby & Co. Ltd.	
Crossley Bros.	
Crosthwaite Furnaces & Scriven Mach. Tools Ltd.	419
Cutler, Samuel, & Sons Ltd.	420
Cuxson, Gerrard & Co. Ltd.	
D	
Davenport Engineering Co. Ltd.	
Davey, Paxman & Co. Ltd.	
Dean, W. H., & Son Ltd.	
De la Rue, Thomas, & Co. Ltd. (Gas Group)	
Demolition & Construction Co. Ltd.	
Dempster, R. & J., Ltd.	
Dempster, Robert, & Sons Ltd.	
Denison & Son Ltd.	
Derbyshire Silica Firebrick Co. Ltd.	372
Diaphragm & General Leather Co. Ltd.	
Donkin (The Bryan) Co. Ltd.	Cover II
Douglas, Wm., & Sons Ltd.	390
Drakes Ltd.	374
Dresser Manufactures (England) Ltd.	375
Drew, H. B., Ltd.	
Drummond Patents Ltd.	386
E	
Eagre Construction Co. Ltd.	
Edgar, Wm., & Son Ltd.	
Elcontrol Ltd.	
Electroflo Meters Co. Ltd.	
Electrolux Ltd.	
Elliott Bros. (London) Ltd.	
Ether Ltd.	
Evered & Co. Ltd.	
Ewart & Sons Ltd.	
Ewart Chainbelt Co. Ltd.	
F	
Fisher & Ludlow Ltd.	
Flavel, S., & Co. Ltd.	
Fluidrive Engineering Co. Ltd.	
Fowler, John, & Co. (Leeds) Ltd.	
G	
Gas Purification Ltd.	425
General Electric Co. Ltd.	
Gibbons Bros. Ltd.	
Girdex Engineering Co. Ltd.	
Glover, George, & Co. Ltd.	371
Glover, Thomas, & Co. Ltd.	
Godfrey, Sir George, & Partners (Industrial)	
Goodall Clayton & Co. Ltd.	
Goodyear Industrial Rubber Products Ltd.	410
Graphite Products Ltd.	
Green & Boulding Ltd.	
H	
Hamilton, A. H., & Co. Ltd.	
Hardman & Holden Ltd.	
Harris & Pearson Ltd.	
Harris Engineering Co. Ltd.	
Harrisons (London) Ltd.	
Harvey, G. A., & Co. (London) Ltd.	
Hick Hargreaves & Co. Ltd.	
Hills (West Bromwich) Ltd.	
Hilmor Ltd.	
Holman, Michell & Co. Ltd.	
Holmes, W. C., & Co. Ltd.	427
Hopkinsons Ltd.	
Horstmann Gear Co. Ltd.	384
Hudswell, Clark & Co. Ltd.	
Hughes, F. A., & Co. Ltd.	
Humphreys & Glasgow Ltd.	
Hyde, Silas, Ltd.	
I	
I.C.I. Ltd. (Metals Division)	
Ideal Boilers & Radiators Ltd.	
Inertol Ltd.	
Ingham, John, & Sons Ltd.	
J	
Jeavons, E. E., & Co. Ltd.	
Jeavons Engineering Co.	
Jenkins, W. J., & Co. Ltd.	
Johnson, C. H., (Machinery) Ltd.	
Joy-Sullivan Ltd.	
K	
Keay, E. C. & J., Ltd.	
Keelavite Rotary Pumps & Motors Ltd.	
Keith Blackman Ltd.	428
Kings Patent Agency Ltd.	425
King, Walter, Ltd.	425, 426
Kirkham, Hulett & Chandler Ltd.	
L	
Lafarge Aluminous Cement Co. Ltd.	
Lamont, James H., & Co. Ltd.	
Le Bas Tube Co. Ltd.	393
Lee, Howl & Co. Ltd.	
Lincoln Electric Co. Ltd.	
Lind, Peter, Ltd.	
Lionweld Ltd.	
M	
MacLellan, George, & Co. Ltd.	
Macpherson, Donald, & Co. Ltd.	
Magnetic Valve Co. Ltd.	
Main, R. & A., Ltd.	
Major Robinson & Co. Ltd.	
McNeill, F., & Co. Ltd.	
Meltham Silica Fire Brick Co. Ltd.	
Metal & Pipeline Endurance Ltd.	
Meters Ltd.	
Metropolitan Vickers Electrical Co. Ltd.	
Midland Iron & Hardware Co. (Cradley Heath) Ltd.	425
Milne (Edinburgh) Ltd.	
Mint, Birmingham Ltd.	
Mitchell Engineering Ltd.	
Mitchell, H., & Co.	
Monk, A., & Co. Ltd.	
Murex Welding Processes Ltd.	
N	
National Enamels Ltd.	
Neal, R. H., Ltd.	
Neville, J. C., Ltd.	
New Conveyor Co. Ltd.	
Newton Chambers & Co. Ltd.	Cover I
Norwest Construction Co. Ltd.	
Nu-Swift Ltd.	425
O	
Oxley Engineering Co. Ltd.	
P	
Parkinson & Cowan (Gas Meters) Ltd.	398
Parkinson Stove Co. Ltd.	
Pease, E., & Co. Ltd.	392
Peebles & Co. Ltd.	
Perl Controls Ltd.	397
Plenty & Son Ltd.	
Power-Gas Corporation Ltd.	Cover IV
Press, William, & Son Ltd.	381
R	
Radiant Heating Ltd.	
Radiation Ltd.	408, 409
Rawlplug Co. Ltd.	380
Reavell & Co. Ltd.	423
Ride & Bell Ltd.	
Roberts, R. E., & Sons Ltd.	
Robinson, J. H., & Co. (Liverpool) Ltd.	
Royston, Geo., & Sons Ltd.	
Rozalex Ltd.	424
S	
Salter, T. E., Ltd.	
Saunders Valve Co. Ltd.	
Sawyer, Geo. E., Ltd.	
Scientific & Projections Ltd.	
Senior Economisers Ltd.	
Shell Chemical Co. Ltd.	
Siebe Gorman & Co. Ltd.	
Sigma Instrument Co. Ltd.	391
Silvertown Rubber Co. Ltd.	
Simon, Richard, & Sons Ltd.	
Smith & Nephew Ltd.	
Smith Meters Ltd.	
Smith, Thos., & Sons (Rodley) Ltd.,	
Spencer-Bonecourt Clarkson Ltd.	
Sperryn & Co. Ltd.	371
Stanton Ironworks Co. Ltd.	
Staveley Iron & Chemical Co. Ltd.	388
Stein, John G., & Co. Ltd.	391
Stewart & Gray Ltd.	
Stewarts & Lloyds Ltd.	
Stillite Products Ltd.	
Stoves Ltd.	
Strachan & Henshaw Ltd.	
Stringer Bros.	426
Sugg, Wm., & Co. Ltd.	
Sutcliffe Speakman & Co. Ltd.	
Sutherland, A. G., Ltd.	
T	
T & T Works Ltd.	390
Thorp, Thomas, & Co. Ltd.	
Tully Engineering Co. Ltd.	
Turners Asbestos Cement Co. Ltd.	378
U	
Underpressure Engineering Co. Ltd.	
United Gas Industries Ltd.	
V	
Vaughan, Edgar, & Co. Ltd.	
Vauxhall Motors Ltd.	382, 383
Visco Engineering Co. Ltd.	
W	
Wakelin, F. H., Ltd.	425
Walker Bros. Ltd.	
Walker, C. & W., Ltd.	
Walker, Crosweller & Co. Ltd.	
Walkers (Century Oils) Ltd.	424
Waller, George, & Sons Ltd.	396
Walter King Ltd.	425, 426
Ward, Thos. W., Ltd.	
Weir, G. & J., Ltd.	
Wellington Tube Works Ltd.	
West's Gas Improvement Co. Ltd.	Cover III
West's Piling & Construction Co.	
Westwood & Wrights Ltd.	
Whessoe Ltd.	379
Whitley Moran & Co. Ltd.	389
Whitlock Bros. Ltd.	Cover II
Widnes Foundry and Engineering Co. Ltd.	
Wilkes, A. H., & Co. Ltd.	428
Williamson, Cliff, Ltd.	
Wilson, George, Gas Meters Ltd.	385
Winn & Coales Ltd.	
Woodall-Duckham Construction Co. Ltd.	407
Wood, Hugh, & Co. Ltd.	
Y	
Yorkshire Copper Works Ltd.	
Agencies	
Appointments Vacant	425, 426
Appointments Wanted	
Books	
Contracts Open	
Educational	
Fellowship	
Miscellaneous	
Patents	
Plant &c. For Sale	425
Publications	
Public Notice	

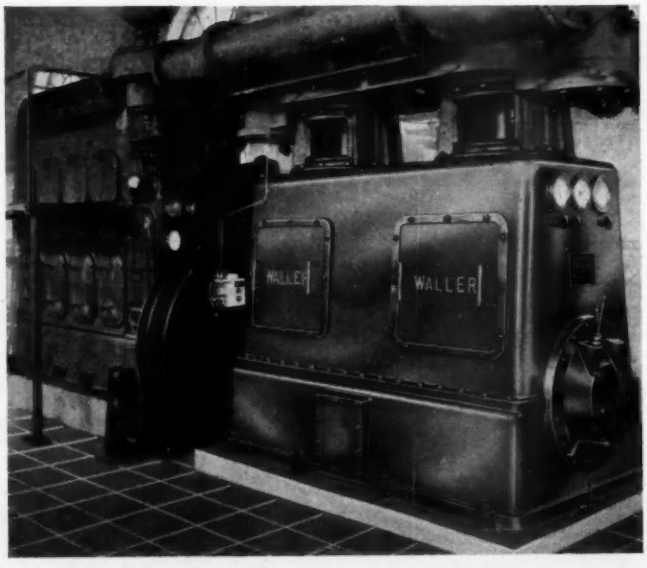
This Changing World

Take the yolk of six eggs...

In those far off days of lavish cooking, when Mrs. Beeton's word was still law, many a Victorian housewife must have hesitated to offend the prejudices of her cook by asking her to cope with such new-fangled nonsense as cooking by gas.

But demonstrations by James Sharp of Northampton in 1832, and the introduction of Grant's stove cooker in 1853, had proved the practicability of gas as a cooking fuel, and before the century was over the old kitchen range was definitely in retreat. Before this could happen, however, many supply problems had to be solved, and as far back as 1855 the Phoenix Iron Works at Stroud in Gloucestershire were making an important contribution towards the successful development of the gas industry.

The Waller compressor illustrated is one of hundreds designed for gas transmission. *Photograph by courtesy of East Midlands Gas Board.*



GEORGE

WALLER

& SON LTD.

Phœnix Iron Works, Stroud, Glos.

Telephone : Brimscombe 2301/2

Member of the Society of British Gas Industries

Available NOW!

an extension of the PERL range

THE PERLECTRIC

GAS/ELECTRIC SWITCH TYPE NO. 22

what does it do?

IT IS THE LINK . . . that couples flame-failure protection with electrical control

It operates a magnetic fuel valve (gas or oil), and, in addition, an alarm device, an electric igniter, and similar devices. It is designed on the well-tried and proven thermo-electric principle.

THE FULL RANGE OF "PERL" CONTROLS INCLUDES:
Magnetic Gas Valves, Thermostats, Relay Valves, Ignition and Combustion Protection Sets.

If your problem is flame-failure or thermostatic control— PERL *can solve it*

PERL CONTROLS LIMITED

672 FULHAM ROAD, LONDON, S.W.6 RENown 5555-6
Works: 45 GATWICK ROAD, CRAWLEY, SUSSEX 25115-6

Gas Journal

VOL. 289 NO. 4884 February 20, 1957

109TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Geoffrey W. Battison

TECHNICAL EDITOR: Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M. Inst. F.

Published by Walter King Limited,
11, Bolt Court, Fleet St., London, E.C.4

Telephone: FLEet Street 2236-7 Telegrams: Gasking, Fleet

CONTENTS

EDITORIAL COMMENT

Oil in Europe .. 399
Mr. Haynes Hits Out .. 400

NEWS OF CURRENT EVENTS

Personal .. 401
Diary .. 401
Calendar and Directory Alterations .. 401
Edinburgh Gets New Streamlined Service .. 402
Long Service Awards at Liverpool .. 402
Up and Up Goes the Industrial Gas Load .. 403
New Electricity Board Vesting Day is Advanced .. 403
York Juniors Hear Talk on Pre-stressed Concrete .. 403
York Works to Close in Four Years .. 403
Company Notes .. 404
Keeping the Gas Lights Burning .. 404
News in Brief .. 404
Industrial Sales Are 3% Up in Half Year .. 405
New Device Used to Find Mining Subsidy Leaks .. 405
New Shell Water Gas Process .. 405
Bergen Gasworks Marks Centenary .. 405
New Books .. 420

TECHNICAL RECORD

Maintenance on the Works. By W. E. Dobson .. 406
Gas is Competitive. By A. Higgs .. 414
Gas On the Continent .. 421

PUBLISHERS' NOTICE, SEE PAGE 425

Meters are bought nowadays on
a cold assessment of product
performance. That is why
the sales of Parkinson meters
are rising each year.

PARKINSON & COWAN
GAS METERS

Gas Journal

VOLUME 289. No. 4884. FEBRUARY 20, 1957. 109th YEAR

Oil in Europe

EVER since the Suez crisis, the availability of oil to industry in general and to the gas industry in particular has continued to be of greater and greater interest to both industrialists and economists. The report published by O.E.E.C. called 'Oil, the outlook in Europe' which appeared just about the time of the crisis, but was compiled before it, provides interesting reading and will therefore repay a second glance.

As is well known, the refining industry has increased enormously in the United Kingdom and Europe since the war, so that whereas before and during the war the imports of oil were largely confined to refined products, imports in the last ten years or so have consisted to a greater and greater extent of the crude oil for refining in the importer's own country. This has meant a decreasing dependence on the refineries abroad, either in America or the Persian Gulf, and has the advantage of enabling the consumer of the oil products to control the type of product being made, and at the same time make available a greater number of by-products as raw materials for other industries, or subsidiary manufacturing processes of the oil company. Thus the output of fuel oil can be increased to a limited extent at the expense of the production of petrol and the setting up of a whole new industry for the manufacture of such things as detergents can be encouraged both to overcome a possible shortage of fats, and to make use of what almost becomes a new indigenous source of raw materials.

The enormous increase in the consumption of oil in Western Europe since the war is shown by the comparison of figures for 1947 and 1955. In 1947, the consumption of oil in Western Europe stood at 37 mill. tons but had risen to 100 mill. tons in 1955, with a provisional figure for the first half of 1956 showing an annual increase even greater than the average annual increase since 1947. On these figures, the report estimated that at the then rate of increase, the consumption of oil in 1960 will have risen by 50%, and will very likely double itself between 1960 and 1975.

It is clear that oil is becoming increasingly necessary for meeting Western Europe's needs for energy. It is no longer that the great demand for refinery products lies in the range of low boiling petroleum products to supply the needs for the petrol engine, or even in the production of diesel fuel for heavy transport needs, but oil is becoming in greater demand as a source of energy which has until comparatively recently been met by solid fuel. This last point emphasises more than ever the importance of oil in the expansion of industry in Western Europe. It almost seems that no further expansion can be expected if solid fuel only is considered and its expansion or at any rate maintenance at its present level depends on the ability of the known oil fields to supply the crude, and the ability of the tanker fleets to transport it to the Western European refineries. The general impression given by the report as to the known resources of oil is that in the past estimates of proved reserves were so often wide of the mark and out of date within a year or so by the discovery of vast new resources, that they merely make the observation that there should be no shortage over the period under review, and that there may be some additional but modest contribution of oil and natural gas from indigenous sources in Europe.

But this is all very well. The report assumes a steady flow of oil from the Middle East, and that the vastly expanding consumption of oil in Europe will provide the Middle East producing and transporting companies with all the income necessary for their economic development and permanent improvement in the standard of living in these areas.

Thus the prosperity of Europe and the development of the Middle East are mutually dependable on each other and should be allowed to follow the predetermined plan. But if this is not allowed to happen, or at any rate be slowed down temporarily by the Suez crisis, how will Europe maintain her present level of industrial activity? It seems that there is a need for some other source of low grade energy for power production which can work with, and slowly take over from, solid fuel—in fact the expansion of atomic energy to such an extent that all low grade energy will eventually be found by atomic reactors, and the processing of coal and oil for production of refined forms of energy to an ever greater extent than is being done now. The gasification of both coal and oil as at present but on an even larger scale, would include the hydrogenation of these valuable raw materials, especially oil, which has shown to be capable of producing a gas with suitable characteristics

for use as town gas, and on a scale which will, it is hoped, make it competitive with all other fuels.

It seems that perhaps the gas industry might have to consider reverting to its ideal of becoming in fact as well as in mind a one fuel industry and leaving the production of solid fuel with convenient supplies of surplus gas to its sister industry under the control of the N.C.B.

Mr. Haynes Hits Out

MR. J. T. HAYNES, who recently toured New Zealand at the invitation of a number of electrical undertakings in order to assess the technical condition of the gas industry and suggest steps which could be taken to make the many seriously deteriorated undertakings an effective investment, was mentioned in an editorial in our issue of January 30, in which we speculated on Mr. Haynes's findings. We have now received a reprint of an article in *Live Lines* which he wrote on the eve of his departure from New Zealand which shows that most of our guesses concerning his evaluation of the industry were not far from the mark.

It will be remembered that one of the headaches of the electricity industry in New Zealand at the present time is the forthcoming acquisition by power boards and municipal electricity committees of the gas undertakings in their respective areas. In his article Mr. Haynes points out that prior to nationalisation many local authorities in Great Britain had both gas and electricity committees and in some towns with populations as high as 50,000 the gas and electricity undertakings were run by joint committees. Since it was generally recognised that healthy competition between both industries did them good, he does not feel that New Zealand need be afraid that she can handle such a problem with any less success. Mr. Haynes says that he has been surprised at the sad state of most of the gas undertakings in New Zealand in which there is a legacy of repairs and replacements which has accumulated during the last 20 years or so. As a result of Government controls, restrictions on capital expenditure, national and local encouragement of the electrical industry, and the keen, business-like competition of the electricians, the gas industry has virtually 'thrown in its hand.' The public, he says, has lost faith in gas, if indeed it ever had any. Moreover, the gas industry appears to have lost faith in itself.

Mr. Haynes goes on: 'I cannot help but feel that such a change is for the better, but we must not expect the gas industry to suddenly blossom forth overnight and become in New Zealand as important as it is in England. It cannot be denied that under existing management there has been more keenness on the declaration of dividends than on the maintenance of the works and reticulation systems. In the case of municipal authorities, the gas undertakings have been "milked" for the relief of rates. In this way the gas customers have been relieving the burden of the ratepayers, including those who use electricity only, and now a change is taking place I do hope that the electricity customers will not complain if they are called upon to make a contribution towards the revival of the gas industry.'

Speaking of the 'unfortunate and almost distressing' shortage of technically trained and qualified gas engineers in New Zealand, Mr. Haynes points out that although the smaller undertakings cannot afford highly trained and expensive officials, a step in the right direction was taken a few years ago when the Gas Association of New Zealand put on the road two mobile gas laboratories which visit gasworks periodically. In his view, this principle should be developed so that not only gas chemists visit the works but also competent gas engineers who can advise the respective power boards on technical matters. He advocates the training of young men to fill the vacancies which occur from time to time. He also suggests that there are several points about the country where small and inefficient gas undertakings can be linked together and supplied with gas in bulk through small diameter high pressure steel mains from a central and larger gasworks which can be run efficiently and economically. Two such schemes are already on the drawing board—Auckland and North Shore, and Wellington and Petone—but there are several others which would justify an early investigation.

Concluding, Mr. Haynes evinces hope that the New Zealand gas industry can be successfully resuscitated, and adds, 'The ball is now in the hands of the electricity administrators and it is up to them to maintain their reputation both as administrators and as successful business men.'

It was hardly to be expected that this condemnation of the existing industry would go unchallenged, and indeed, Mr. Haynes has not had everything his own way. In a newspaper article the Chairman of the Gas Association of New Zealand, Mr. D. H. Chrisp, maintains that Mr. Haynes was guilty of making many misleading statements. 'This gentleman's tone is so biased that it must be considered to be written for propaganda purposes . . . It is not true to say that the New Zealand gas industry has thrown in its hand, nor is it correct that there has been more keenness on the declaration of dividends than on the maintenance of the works and distribution systems. Of Mr. Haynes's statement that the Government has so little faith in the management of the gas industry that it was decided to transfer the management to the live, business-like and progressive bodies controlling the electrical industry, Mr. Chrisp comments that 'Mr. Haynes may have obtained this information from an authoritative Government source during his short stay in the Dominion but no such opinion on existing management has been expressed to the gas industry by the Government or its officers.' Neither could they recall its having been given as a reason for the proposed amalgamation of gas undertakings with electrical concerns. Mr. Haynes's view that the gas industry will have a major part to play in the progress of this promising country has in Mr. Chrisp's words 'always been the view of the gas industry . . . no doubt gas consumers will be glad to know that some of the electrical supply authorities have convinced Mr. Haynes of their intention to develop the industry.'

It is not surprising that some of Mr. Haynes's hard-hitting statements have aroused the wrath of the undertakings of the New Zealand gas industry, but we who have known Mr. Haynes for many years and can vouch for his technical abilities and his gift for fair assessment have little doubt that his summing up of the New Zealand situation is both shrewd and scrupulously fair.

Personal Notes

LT.-COL. J. A. GOULD, M.C., retires today at his own request from the post of Distributing Engineer to the South Eastern Gas Board, two years before his official retiring date. Lt.-Col. Gould entered the engineering department of the South Metropolitan Gas Company at Old Kent Road works in 1910, and received his early training under the late T. S. F. Gibson, who was later Chief Civil Engineer to that Company. In the 1914-18 war he won the Military Cross, and on his return to the Company in 1919, was engaged on civil engineering works at East Greenwich and Belvedere. He later returned to Old Kent Road and was subsequently transferred to the Mains Department in 1923 and appointed Mains Superintendent by the late Dr. Charles Carpenter in 1926. In 1927 to 1928 he planned and laid a 36-in. main to connect the East Greenwich works of the South Metropolitan Gas Company with the Sydenham works of the South Suburban Gas Company, which now forms the commencement of the South Eastern Gas Board's South London main. In 1929 he was Station Engineer of the Bankside and later of the Rotherhithe gasworks. In 1931 he planned and carried out transmission schemes and general mainlaying work to meet the building boom and general expansion of the Company's district at that time. Lt.-Col. Gould was responsible for dealing with air raid damage on the South Suburban Company's district during the second world war and formed and commanded the 19th County of London (South Suburban Gas Company) Battalion of the Home Guard. On vesting day he was appointed Distributing Engineer to the South Eastern Gas Board and has been concerned with planning the integration schemes that have taken place in the Board's Area. Lt.-Col. Gould is a Member of the Institution of Mechanical Engineers, the Institution of Gas Engineers and a Fellow of the Royal Society of Arts.

MR. P. THOMPSON has been appointed Manager of the new bar and rod mill of Samuel Fox and Co. Ltd., Stocksbridge. MR. A. E. HANSELMAN is appointed Assistant Manager, rolling; MR. L. LONG, Assistant Manager, warehouse and treatment; MR. A. CROSSLEY, Manager, steel treatment department; and MR. C. BROOKS, Assistant Manager, No. 1 melting shop.

MR. JOSEPH R. SPANGARO, a senior engineer in the Sydney office of Humphreys & Glasgow Ltd., arrived in London by air this week, from Australia. He is here to study the latest developments in oil gasification and other activities of the company.

MR. DENNIS M. ROBINSON, younger son of the late MR. SANDFORD ROBINSON and grandson of the late MR. JOSEPH H. ROBINSON, the founder of J. H. Robinson & Co. (Liverpool), Ltd., has been appointed Chairman of the Board of that Company.

MR. FRANCIS GEORGE BREWER, Secretary of the Gas Council since 1949, who was awarded the O.B.E. in the New Year Honours, poses for the cameraman after his investiture by the Queen at Buckingham Palace last week. Mr. Brewer has been in the gas industry since 1934 when, after a varied career as classics master at Haileybury, service in the first world war, an assistant in the Secretaries' Office of the Board of Inland Revenue, and sub-editor and foreign correspondent for *The Times*, he was appointed Secretary of the South Metropolitan Gas Company.

MR. P. C. BECKETT, of Sanders & Forster, Ltd. (a member of the 'Chamberlain' group of companies), is to carry out a four months' tour of the Central Americas and the countries of the Caribbean to assess the potential market for the company's steel storage, crane, and hangar buildings, and where applicable, to appoint selling agents.

MR. H. P. LUPTON, who, as reported in these columns last week, has retired from the Industrial Gas Development Committee, has not, as stated, retired from the North Western Gas Board. He has not, as also stated, completed the preparation of the proofs of his book on industrial gas, having to date only just completed the 'draft' of the chapters in the book.

Diary

February 21.—MIDLAND JUNIORS: Visit to John Harper and Co., Ltd., Albion Works, Willenhall, 2 p.m.

February 21. — BUILDING CENTRE FORUM: Store Street, Tottenham Court Road, London, W.C.2, 6 p.m. 'Light Fittings.'

February 21. — INCORPORATED PLANT ENGINEERS, BLACKBURN BRANCH: Golden Lion Hotel, 7.30 p.m. 'The Application and Maintenance of Centrifugal Pumps,' by Mr. G. O. Stevenson.

February 25. — INCORPORATED PLANT ENGINEERS, WEST AND EAST YORKSHIRE BRANCH: Leeds University, 7.30 p.m. 'Fuel and the Future,' by R. H. Evans, Professor of Coal Gas and Fuel Industries, Leeds University.

February 25. — INSTITUTION OF GAS ENGINEERS: Joint Meeting with the INSTITUTION OF CIVIL, MECHANICAL AND ELECTRICAL ENGINEERS: The Institution of Civil Engineers, 5.30 p.m.

March 1. — LONDON AND SOUTHERN JUNIORS: Meyerstein Theatre, Westminster Hospital School of Medicine, Horseferry Road, S.W.1, 6.30 p.m. General Meeting. 'The Quantities Involved in the Rating and Performance of Dry Purifier Installations,' by F. H. Cope.

March 2.—SCOTTISH WESTERN AND EAST OF SCOTLAND JUNIORS: Gas Showrooms, 522, Sauchiehall Street, Glasgow, C.2, 3 p.m. Joint Meeting.

March 5.—EAST MIDLANDS G.C.C.: Victoria Station Hotel, Nottingham, 11.15 a.m.

March 5.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, London, S.W.1, 11 a.m.

March 5.—INSTITUTION OF CHEMICAL ENGINEERS: The Geological Society, Burlington House, London, W.1, 5.30 p.m. 'Radiation from Luminous Town's Gas Flames,' Parts I and II, by S. R. Tailby, M. D. Ashton and I. Berkovitch.

March 5.—MIDLAND JUNIORS: Staff Mess Room, West Midlands Gas Board, Birmingham District, Council House, Birmingham. 'Industrial Gas Forum.'

March 6.—SOUTH WESTERN G.C.C.: Taunton, 11 a.m.

Calendar & Directory

Alterations

The following changes have been notified during the past month. To keep the information in the current issue of the 'GAS JOURNAL' Calendar and Directory up to date readers are invited to note these alterations in the Directory Section.

Page D15.—EAST MIDLANDS GAS BOARD: Alderman Charles Newton, M.B.E., and Councillor W. Albans, part-time *Members.*

Page D53.—LIVERPOOL GROUP: '*Accountant*' should read, F. E. Starkey, A.C.I.S., A.C.C.A., A.C.W.A.

Page D67.—SOUTH EASTERN GAS BOARD: A. H. Savill, *Senior Production Engineer;* T. A. Canning, *Production Engineer.*

Page D108.—ARBROATH DISTRICT: Gas Tariff should read 'No. 8.'

Edinburgh Gets New Streamlined Service

ALL FACILITIES HOUSED IN ONE BUILDING

Large-scale Use Made of Radio Controlled Vans

A STREAMLINED service for Edinburgh gas consumers has just been set up by the Scottish Gas Board. It is a completely new system under which all personal visits or enquiries from members of the public can be dealt with at one point at which all essential departments have been co-ordinated to ensure maximum efficiency and speed in operation.

In addition, for service to consumers in their own homes, the city has been divided into six districts, in every one of which radio-controlled vans—manned by teams equipped respectively to deal with emergencies, gasfitting and maintenance work — will be constantly available.

The new organisation operates from the building in Waterloo Place, Edinburgh, which was originally occupied by the Edinburgh and Leith Gas Commissioners and later became the Edinburgh Corporation Gas Department offices. During the last war it was requisitioned by H.M. Customs and Excise, and did not return to the gas service until about six months ago.

The interior of the building has now been redesigned to accommodate the new service centre, showrooms, and offices in the co-ordinated pattern necessary to provide a swift, efficient, and comprehensive service to consumers.

Information Centre

Features of this new under-one-roof administrative structure include a new service and sales centre, containing modern appliances and facilities for handling all financial transactions and requests for services from consumers. An information centre has been established, where the progress of all work with consumers is recorded and supervised, while there is also a new accounts collection department to take over the collection of accounts formerly carried out for the Board by Edinburgh Corporation.

The sales progress organisation, which handles all consumers' enquiries for appliances, has been transferred from the George Street showroom. An interview room has been set aside where customers may discuss matters of a confidential nature.

In a new approach to the after-sales service problem, Edinburgh has been divided into six gasfitting districts, each having three zones. Every district is served by separate teams formed for emergencies, gasfitting, or maintenance. Each team is controlled from its own van, which operates in a particular district.

The vans of the emergency and gasfitting teams are equipped with short-wave radio, and the van of the maintenance team operates in conjunction with the radio-equipped gasfitting van. All vans are directed by a central radio control, operated by one person.

When the volume of gasfitting work is heavy, the work will be allocated by zones inside every district. Every district is sub-divided into three zones, and, for example, zone 'A' in District 2 may be served on Monday and Thursday and, the following week, on Tuesday (Saturdays and Sundays are not taken into account for the gasfitting and maintenance teams).

This means that in any period no more than two weekdays will elapse between any one zone being served. All zones will be served continuously by the emergency vehicle teams.

'Press-button Contact'

In order to minimise delays, a specialised telephone bureau has been created. The telephonists are located in the information centre, and have 'press-button contact' with approximately 15 different points in the organisation.

A consumers' register has been built up, listing the 200,000 premises in the city to which gas is supplied. A card exists for every consumer. When a consumer makes an enquiry or request, the clerical staff have an up-to-date record of previous transactions at that particular address.

A gasfitting planning department has been set up to programme the work on the emergency, gasfitting, and maintenance vehicles; to keep detailed check on the progress of the work and to ensure a close co-operation of men and materials; and to supply statistics of jobs on hand and jobs completed.

Consumers can now secure the services of the Scottish Gas Board by telephoning the information centre; calling at any showroom in the city; or writing to the Divisional Controller at Calton Hill.

In the case of telephone calls, the switchboard operator will connect the consumer to the information centre, where one of the telephonists will note details of the service required. This telephonist will have immediate access to the consumer register and to key points in the service organisation.

Emergency Action

In the event of a gas leak or escape the information received from the consumer will be telephoned to the radio control operator, who will call up the van operating in the appropriate district and direct it to the consumer's address. The emergency van team will carry out a temporary repair, or otherwise render the installation safe pending the arrival of the mobile control vehicle, which has more adequate resources for making permanent repairs. The emergency van keeps in touch with central radio control every half-hour.

In cases other than emergency, particulars will be taken at the telephone bureau. These pass to the information centre for recording in the consumer's register and forwarding to the gasfitting planning department, so that the work may be carried out on the next zone-day in the consumer's district.

The transfer of the sales administration from George Street to the new premises at Waterloo Place has permitted the streamlining of consumers' enquiries regarding purchase of appliances. The progress of all enquiries is followed in detail by the sales progress section.

When an appliance is bought, the stores, transport, and gasfitting progress departments co-operate for the speedy delivery and installation of the appliance. From the consumer's register it becomes apparent if there is any undue delay, and steps can be taken immediately to trace and overcome the delay as quickly as possible.

LONG SERVICE AWARDS IN LIVERPOOL

Mr. Frank Fisher, Sales and Service Officer, Liverpool Group, presents long service awards to members of his section who have completed a total of 25 years with the Group and the former Liverpool Gas Company before vesting day.

Up and Up Goes the Industrial Gas Load

INFRA-RED OVENS INSTALLED IN TWO MORE FACTORIES

ADDING to the ever-increasing industrial gas load, a gas fired infra-red drying oven has recently been installed in the new factory of Arrow Electric Switches, Ltd., at Uxbridge. It is a horizontal conveyor oven, designed and constructed by the Potterton Division of Thomas De La Rue & Co., Ltd.

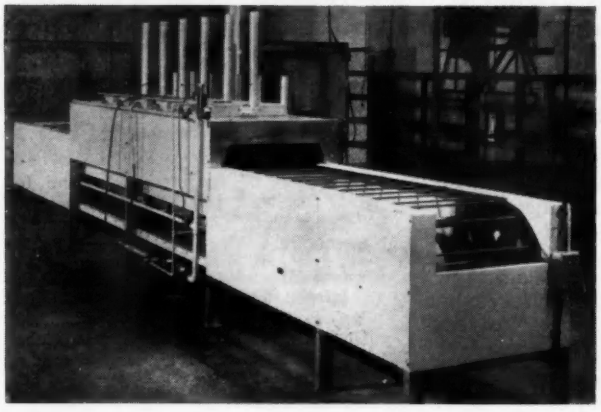
Incorporating six horizontal panels radiating downwards and six horizontal panels radiating upwards, the oven was designed to stove, in various colours, switch boxes and ancillary equipment.

A mean speed of 2 ft. per minute through the hot zone gives a time cycle of three minutes, and although these sub-assemblies are in some cases of complex shape all are satisfactorily cured without constant alteration of time cycles.

Excellent Results

Another piece of De La Rue equipment, a gas fired infra-red stoving oven, has been installed at the works of Simms Motor Units, Ltd., East Finchley. It carries 24 vertical type infra-red panels with independent pilots set in flashings of polished aluminium.

Each bank can be trimmed to compensate for heat gradient in depth through the tunnel, and all controls are enclosed within the double skinned vestibule. Although articles stoved vary enormously in weight, excellent results are being obtained on a universal time cycle of approximately eight minutes.



The gas fired infra-red drying oven installed by Thomas De La Rue & Co., Ltd., at the new factory of Arrow Electric Switches, Ltd., at Uxbridge.

New Electricity Board Vesting Day is Advanced

THE new Central Electricity Generating Board will assume responsibility for bulk generating and supply of power on January 1 next instead of April 1, the Standing Committee of the House of Commons, considering the Electricity Bill, has decided. The dissolution of the present Central Electricity Authority will also take place on January 1, 1958.

The change was the outcome of an amendment moved by Mr. R. Maudling, Paymaster-General, who said it would be generally agreed that a measure of this character, involving very large changes in the organisation of an important industry, should be carried out as quickly as possible.

The new nuclear-power programme, about which much would be heard in the months to come, was an additional and particular reason why this changeover should take place as soon as possible.

York Juniors Hear Talk on Pre-stressed Concrete

MORE than 40 members of the Yorkshire Junior Gas Association heard Mr. T. Albone, Civil and Structural Engineer to the North Eastern Gas Board, read a paper, 'An Introduction to Pre-stressed Concrete and Its Application to a Gasholder Tank at York,' when they met in York on February 16.

The paper dealt mainly with the design and construction of a tank, partly below ground level, for a spirally guided gasholder now under construction at York, and the author, assuming that the function of the tank in relation to the telescopic portion of the holder is fully understood, concentrated on the design of the tank which introduces a relatively new system of concrete construction.

The new gasholder which the N.E.G.B. decided to build in 1951 was required to replace an existing holder which had reached the end of its useful life and also to allow the Klonne waterless gasholder to be shut down for repairs to be carried out while still maintaining the necessary storage capacity of the work.

The total cost of construction including all excavation and pumping, handrailing to balcony, ladders, and platforming, was approximately £59,000.

There was a short discussion in which Messrs. S. C. Barker (Leeds), O. G. A. Hofmann (Harrogate), P. R. R. Stead (Huddersfield), F. Pendall (Sheffield), L. Showler (York), and J. Hargreaves (Leeds) took part.

The President, Mr. R. H. Anderson (Bradford) personally thanked Mr. Albone for a most interesting paper, and Mr. L. Showler proposed the formal vote of thanks.

Mr. R. E. White, Junior Vice President, thanked Mr. N. C. Sturrock, Group General Manager, York-Harrogate, for facilities and hospitality at the meeting.

Gone with the Wind

A gust of wind during recent severe gales over Northern Ireland swept the water seal from the base of a gasholder at Lisburn works and 70,000 cu.ft. of gas escaped. At a meeting of the Urban Council, Mr. G. A. McNeice, Manager of the gasworks, said it was the third time it had happened in 40 years.

YORK WORKS TO CLOSE IN FOUR YEARS

£600,000 Pipeline Nears Completion

NOW nearing completion, the 32-mile, £600,000 gas pipeline from Tingley, near Bradford, to York is expected to be in limited use by the end of the year. It will eventually close the York works, probably in 1961.

The closure will be gradual, but eventually will be complete except for a small water gas plant to help out in peak periods, states Mr. H. Johnston, Chief Engineer to the North Eastern Gas Board. Gas will be stored in the existing holders at Layerthorpe.

Of the 140 people employed at the York works, as many as possible will be retained and offered transfers to other districts.

Work on the project began in 1953 with the laying of a pipeline from Tingley to Leeds and then in December, 1954, a start was made on carrying it through to York.

COMPANY NOTES

POWER GAS GROUP PROFITS SHOW £68,500 INCREASE

GROUP trading profits and other income for 1955-56 of the Power-Gas Corporation are £860,000, against £828,000 the previous year, the annual report shows. However, a footnote points out that the latter figure does not give a straight comparison, because, owing to a change of accounting date of certain subsidiaries the 1954-55 results included profits from those companies covering a period of 18 months, which had the effect of increasing the group profit by nearly £37,000. If this latter amount be excluded, therefore, the 1955-56 group profits show an improvement of £68,500 on the preceding year, or about 8½%.

Profits this time are subject to heavier deductions for tax and depreciation and the final outcome is equity earnings of 52.6%, covering the 14% dividend 3¾ times. This payment, the same as before, was forecast when making the 'rights' issue last September; the new shares do not rank for the dividend.

Record Broken

The record volume of orders booked in 1954-55, £10.75 mill., was substantially exceeded in 1955-56; some £12 mill. being booked in the first 11 months of that year.

The group is now in the midst of a large-scale development programme designed to enlarge manufacturing capacity and improve efficiency. The first two stages have been completed and the third, for which £1 mill. was raised by last year's 'rights' issue, should be largely completed during 1958.

The expected growth in earnings which should follow has long been reflected in a narrow yield on the shares, at 35s. cum the full dividend, they return no more than 4.1%. At the present level of profits, a 14% dividend on the enlarged capital would be covered just over 2¼ times.

Payment of an interim dividend for 1957 has been foreshadowed for about October next. The shares are, of course, essentially a long-term holding.

Interim dividend of 3½% actual, less tax, is to be paid on the £2,500,000 Ordinary stock of The George Cohen 600 Group, Ltd., for the year ending March 31, 1957.

Interim Ordinary dividend of 5% actual, less tax, for the year ending March 31, 1957, has been declared by Cranes (Dereham) Ltd.

Interim dividend of 5%, less tax, for the year ending April 30, 1957, together with a distribution of 3d. per share, free of tax, out of realised capital profits, has been declared by Stevinson, Hardy & Co. Ltd.

New Birmingham office of Holden & Brooke Ltd., of Sirius Works, Manchester, 12, is at 8, Waterloo St., Birmingham, 2. Telephone MIDland 3953.

Operation of American foundry processes in this country are to be carried out by Lloyd-Brake Shoe Ltd., a new company formed by F. H. Lloyd & Co. Ltd., of Britain, and the American Brake Shoe Co. of the U.S.A.

Cigarettes and Whisky and Cold, Cold Houses

The British public spend more than three times as much on cigarettes and alcohol as they do on fuel for their homes, and of the £521 mill. they do spend each year on coal, gas, electricity, and other fuel forms, at least £250 mill. is wasted.

So said Dr. Harold Hartley, C.B.E., Director of Radiation Ltd., and a fuel efficiency expert, addressing an audience of public health inspectors, at the Manchester College of Science and Technology recently. He was speaking at a new-type course arranged by Manchester University to deal with the provisions of the Clean Air Act.

Keeping the Gas Lights Burning

As a result of persistent efforts to clear stopped gas service pipes not more than 150 lamps have been unlighted at any one time, says Mr. Rowland Nicholas, Manchester City Surveyor and Engineer, in his annual report. It has generally been possible to restrict this number to about 100 or some 0.6% of the total gas lamps installed. This is the lowest figure achieved since the end of the war.

Mr. Nicholas states: 'The Gaythorn Depôt continues to manufacture a limited number of new gas lanterns and purchases of gas equipment are restricted to items of maintenance equipment, such as gas mantles and glass globes. Unless the present rate of conversion is maintained it will be difficult to continue to provide satisfactory gas lighting without taking the retrograde step of purchasing new gas lanterns.'

6 mill. Tons of Coal Leak Away Each Year

Failure to insulate industrial buildings is costing the country up to 6 mill. tons of coal equivalent a year, representing the productive effort of 20,000 miners, Mr. Gerald Nabarro, M.P., stated in the House of Commons recently when his Bill to provide thermal insulation of industrial buildings received an unopposed first reading.

Of 215 mill. sq. ft. of industrial buildings erected during 1951 to 1956, not more than 10% were insulated. The other 90% dissipated in losses between 25 and 50% of fuel consumed for heating purposes.

NEWS IN BRIEF

CATERING FOR THE CATERER

WITH a view to saving local hoteliers and caterers a trip to a national exhibition to keep abreast of the latest equipment, the South-Western Division of the Scottish Gas Board recently staged an exhibition of catering and large-scale cooking equipment in the Town Hall, Ayr.

The appliances on show included ranges, steamers, fish friers, hot cupboards, coffee-making boilers, and similar equipment. The water-heating section comprised both storage and heating, and was of special interest in view of the requirements of the Clean Food Acts.

Under-water oil exploration in the Qatar area of the Persian Gulf is to be continued by the Shell Petroleum Co., Ltd. Since the wrecking of its £900,000 mobile drilling platform in a storm last December, the company had been undecided on whether to continue operating its offshore concession in this region.

Following representations by the Rhyl Undertaking of the Wales Gas Board, the Rhyl Urban Council's Housing Committee are to recommend to the Council that a gas service be installed in every Council house.

Connection of Wallingford, Berks, to the Reading to Oxford trunk line is expected shortly to result in the town's two gas holders being dismantled.

Tenants of future council houses in Banbury are to be allowed the choice of either gas or electric cookers. Hitherto, the Council have only supplied gas cookers.

GAS INDUSTRY STATISTICS

INDUSTRIAL SALES ARE 3% UP IN HALF YEAR

Domestic Load, 1% Down, Offsets Increase

INDUSTRIAL gas sales increased by 3% in the six months ended September, 1956, and commercial sales increased by about 2%. These increases were offset by domestic sales which were 1% down. Total sales of gas were the same as in the corresponding period the previous year.

Sales of gas appliances are again lower than in the previous year, cookers and water heaters showing decreases of 15% and 12%, respectively. Sales of gas fires and washing machines were reduced by 18%.

In the second quarter, July to September, 1956, of the financial year 1956-57, total sales of gas were 1% above total sales for the second quarter 1955-56. Domestic sales in the September quarter were ½% lower than in the previous year but both industrial and commercial sales showed gains of over 3%.

The average realised value per therm of gas sold for the six months was 18.9d., an increase of almost 2d. per therm over the average for the first half of 1955-56.

Between April and September, 1956, the production of coal gas and the tonnage of coal carbonised showed decreases of less than ½%. Water gas production fell by 10% and coke used in water gas making decreased by 11%. Though the use of gas oil and heavy oil in water gas production between July and September, 1956, increased by more than 40% compared with the second quarter 1955-56, the half-year's figures showed a reduction of 10% compared with the six months ended September, 1955.

Gas Purchases

The quantity of surplus gas purchased from coke ovens and oil refineries increased by 13% in the six months 1956-57, whereas total gas made was down by 1%. On balance, total gas available was 1% greater than in the corresponding six months of 1955-56.

Coke production for the first half of the financial year 1956-57 increased by 1% but the sales of coke fell by 10%. Coke breeze production was up by 1%. The output of crude tar also showed a 1% increase while crude benzole production increased by 16%.

Hire purchase restrictions have continued to affect the sales of domestic appliances which were again lower than in the corresponding period of the previous year. In the six months April to September, 1956, 254,000 gas cookers were sold as compared with 299,000 in the first six months of 1955-56.

Sales of wash boilers fell 7%, while refrigerator sales decreased 45%. The hire purchase sales again suffered the greatest setback, though the percentage decreases in the July to September quarter were not so marked as in the April to June quarter of 1956-57.

New gasmaking capacity of 20 mill. cu.ft. were brought into use in the three months July to September compared with 10 mill. cu.ft. in the corresponding quarter of 1955. The total of new plant brought into use for the six months April to September, 1956, was 44 mill. cu.ft., an increase of 12 mill. cu.ft. over the first six months 1955-56.

An increase of 516 miles in the length of new mains laid between July and September brought the total mileage of new mains laid in 1956-57 to 1,110 miles. This figure is lower than that for April to September, 1955, by 240 miles, a drop of 18%.

The total number of employees in the gas industry at the end of November, 1956, was 2% below the employment figure at the end of November, 1955.

New Device Used to Find Mining Subsidy Leaks

AS is well known throughout the industry, the East Midlands Gas Board is faced with considerable trouble due to leaking gas mains damaged by mining subsidence in their area. To combat the risk of dangerous concentrations and the loss of a valuable and refined fuel, the Board has called in the firm of A. M. G. Zuurbier, European agents of an American firm manufacturing a new type of gas leak detector.

The head of this instrument is an electronically heated element capable of indicating fine degrees of combustible material. Air from 9-in-deep holes bored at intervals of 7 ft. over suspected mains is drawn into the instrument through a tube inserted into the holes and the concentration is indicated direct on a dial.

During the first 12 days of a recent survey of the Swadlincote area, the Dutch team operating the detector covered 12½ miles of main and located about 230 places where concentrations of gas were noticeable on their meter. The procedure was then for the Board to investigate further every potential danger spot by using less sensitive equipment directly over the main. During this period it was found necessary to open 30 places as a result of the survey, and almost every one revealed a fault due to drawn joints.

New Shell Water Gas Process

AID TO FERTILISER PRODUCTION

A NEW process for the conversion of oil under pressure into water gas will be used at the £6 mill. plant now under construction at Shell Haven, in Essex, for the manufacture of nitric acid and ammonia which is to form the basis for large-scale production of agricultural fertiliser.

Until now, such gas has been produced in Europe mainly from coke and coal. Other uses of the process are in the steel industry and for the manufacture of town gas.

Dutch Origin

Evolved by n.v. de Bataafsche Petroleum Maatschappij, one of the main operating companies of the Royal Dutch/Shell Group, the new process can use any hydrocarbon ranging from gas to heavy fuel oil as base material and offers an economically attractive and flexible new technique. The first commercial unit in Europe is already operating successfully at Ijmuiden, near Haarlem, in the Netherlands.

The new plant at Shell Haven is expected to go into production in August next year, using 200 tons of feed stock a day. Fisons, Ltd., are erecting a £4.5 mill. factory adjacent to the Shell plant in order to make use of the output to increase their supplies of fertiliser.

Bergen Gasworks Marks Centenary

THE centenary of Bergen gasworks, Norway's largest, was celebrated recently at a dinner in the Rosenkrantz Hotel at which 220 guests — representatives of local authorites, works management, workers, officials, and pensioners— were present. The dinner was duplicated the following night for the benefit of workers and officials on duty in the works.

Mr. Bjorn Paulson, a Director of the Bergen Gas Company, told those present that it was hoped, by the use of Norwegian coal of gas and cokemaking, to make the country's gas industry 100% self supporting. In the past—because Norwegian coal was considered unsuitable—the industry has had to rely on imports from the United States.

The popularity of gas in Norway is steadily increasing and Bergen gasworks provides an excellent service.

From a paper to the Midland Junior Gas Association, February 5, 1957

Maintenance on the Works

By W. E. DOBSON, M.Inst.Gas E.,

DEPUTY WORKS ENGINEER AND MANAGER, SWAN VILLAGE WORKS, WEST MIDLANDS GAS BOARD.

THE future of the gas industry depends to a large extent upon a continued high level of gas and coke sales, and unless the price of these commodities is competitive we are in for a very lean time. It may well be that the changeover to oil-firing by a number of industrial consumers has been discouraged, for the moment, by the unsettled outlook in the oil-producing countries, but it is obvious that, in spite of the loads being obtained by the industrial engineers under the most difficult circumstances, many people in our industry do not appreciate the very serious position in which we find ourselves.

Works productivity and thermal efficiency are at a high level, and attention is now being paid more than ever before to prolonging the life of existing plant. In this way, the high cost of plant replacement in the West Midlands Gas Board's area can be reduced considerably, and it is now its policy to operate preventive maintenance schemes wherever practicable. This paper deals with the existing maintenance arrangements at the Swan Village works and outlines any future plans.

The Swan Village works comprises two works, separated by Swan Lane. The old works has a nominal capacity of five mill. cu.ft. per day of coal gas from continuous vertical retorts and six mill. cu.ft. per day from automatic C.W.G. plant, while the new works has a nominal capacity of 11.5 mill. cu.ft. per day, made up of 8.5 mill. cu.ft. a day of coal gas from continuous vertical retorts and three mill. cu.ft. per day of blue water gas, with a total number of manual employees of about 360 for both works. The combined Swan Village works forms an integral part of the gas supply to Birmingham, Wednesbury, Darlaston, Oldbury, and several other Black Country towns.

Mechanical Plant

All items of mechanical plant are examined frequently by the plant examiner or his assistant. A record is kept of each inspection and is reported in triplicate. One copy is submitted to the foreman fitter, if the item of plant requires attention, and one remains in the possession of the plant examiner. The third copy is submitted to the deputy works engineer and is then forwarded to the Engineer's clerk for record purposes. On completion of the job, the foreman fitter indicates the action taken and this is noted in a plant examination record book. This book is located in the engineer's clerk's office and entries are made by him. The Engineer and Works Manager examines the book periodically and a comprehensive summary of the state of maintenance and repairs is obtained therefrom.

Inspections are carried out on a daily, monthly or quarterly basis but the intervals between inspections are frequently shortened on items of plant where there are any known weaknesses awaiting attention. All lifting tackle is inspected quarterly by the plant examiner, and at every alternate inspection of this equipment an insurance inspector, whose inspections meet the requirements of the Factories Act, 1937, Sections 22 and 23, is present. As a matter of interest, 188 items are subject to examination under these two Sections at the Swan Village plant alone. Lifting tackle is issued to a job from a tackle store, and signatures must be obtained so that a regular inspection can be easily carried out. The tackle is then returned to the store after each job, and is not re-issued until it has been inspected by the plant examiner.

Coal and coke conveying equipment is inspected daily, because past experience has shown that neglect of chain tensioning has proved costly where breakdowns have occurred, but these daily inspections of this equipment are not so detailed as the usual monthly or quarterly inspections of plant, though they do at least ensure that any abnormalities are reported before they cause any serious damage. The monthly inspections of steam engines, compressors and cranes enable a close check to be kept on lubrication, gland packing, etc.

The plant examiner and his assistant are both skilled fitters with many years' experience of gasworks' plant, and in periods of labour shortage, one is often reluctant to release men of this calibre for inspection duties, but obviously a competent man must carry out this work. In an attempt to make full use of the experience of the plant examiner, he has in his charge two fitter improvers, who, although they are only engaged on this work temporarily, enable the plant examiner to carry out the major part of the work recommended by the Board's Area Safety Officer, and to bring a number of outstanding items of maintenance up to date. From the close supervision and instruction which these men receive both they and the plant have benefited greatly.

All gas valves at the works are examined quarterly, operated as far as working conditions will allow, and receive the necessary lubrication. Those valves which are defective are attended to as soon as possible, but frequently they have to wait until the shut down periods at bank holidays. This work is carried out by a gas valve maintenance man, who, when not engaged on this work, is a general utility man, but with the more stringent regulations connected with the examination of vessels, for instance, detarrers, it is essential that valves are gas tight and his work becomes of greater importance. Each valve therefore is numbered and a record kept by the head foreman of all inspections, so that an annual report of the state of all gas valves may be submitted to the Divisional Engineer.

Normal electrical inspection is carried out as part of the preventive maintenance scheme, but a statistical maintenance control is carried out by a plant examiner who visits the four Birmingham works. This examiner carries out independent inspections of a cross section of the electrical equipment at each works, which enables him to complete a record sheet which is returned to the electrical records office. This general preventive maintenance scheme and the inspection of this section have been most successful, and while they have operated over the last five years, the number of items of electrical equipment which have had to be sent away each year for repairs has rapidly decreased. This in itself pays tribute to the effectiveness of the scheme.

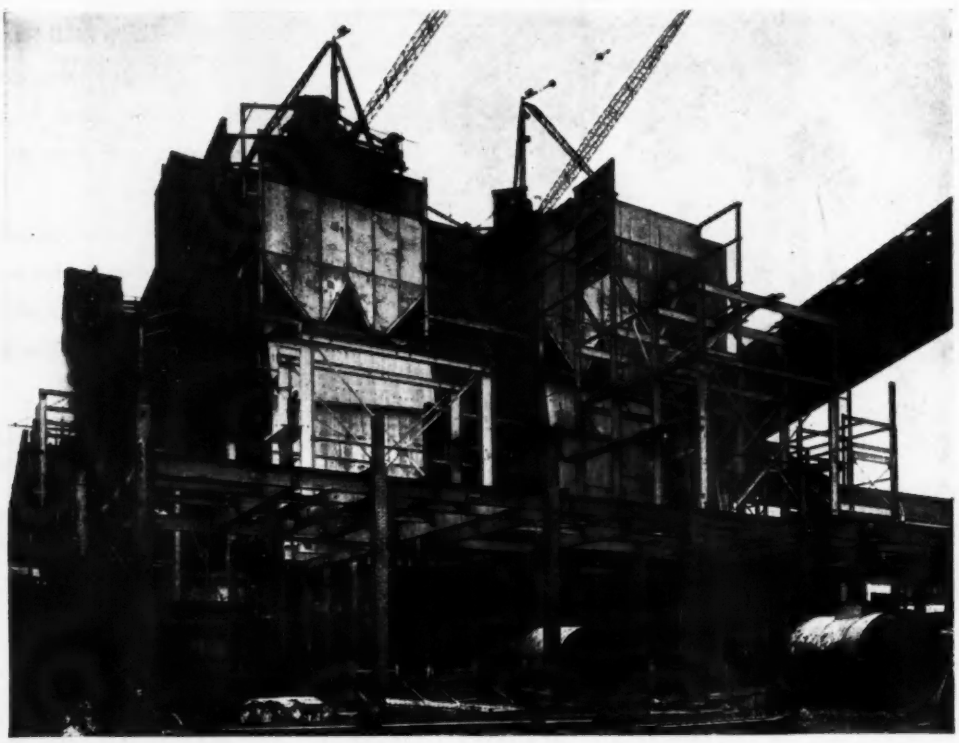
The Deputy Engineer is responsible to the Engineer and Works Manager for all maintenance carried out at the works, and orders of priority are arranged with the foreman or leading hands at a weekly meeting. In the electrical section, all requirements are submitted to the Divisional Electrical Engineer.

Increased in Strength

In the mechanical section the foreman fitter has an assistant who takes direct control of the C.W.G. plant and coke screen maintenance. The plant examiner is the foreman fitter's deputy in cases of sickness or holidays, and, because of his regular duties, is well-suited to do this. The total labour force in the section, which averages 65 men, includes four rough fitters engaged on retort ironwork maintenance who are directly controlled by the retort house staff. This force has increased in strength since 1948, when it had 31 men, but the average weekly output has also increased from 32.5 mill. cu.ft. to 125 mill. cu.ft. in 1956. Because of the great difficulty experienced in obtaining the right type of fitter, it has been necessary

NOW UNDER CONSTRUCTION

The second W-D Continuous Vertical Retort Installation at the Dover Works of the South Eastern Gas Board — 48-82" Lambent Heated Retorts. A third installation of 24 Retorts is also under construction. These two installations will have a total daily gasmaking capacity of approximately 7½ million cubic feet of 500 B.Th.U. gas.



WOODALL-DUCKHAM
CONSTRUCTION COMPANY LTD

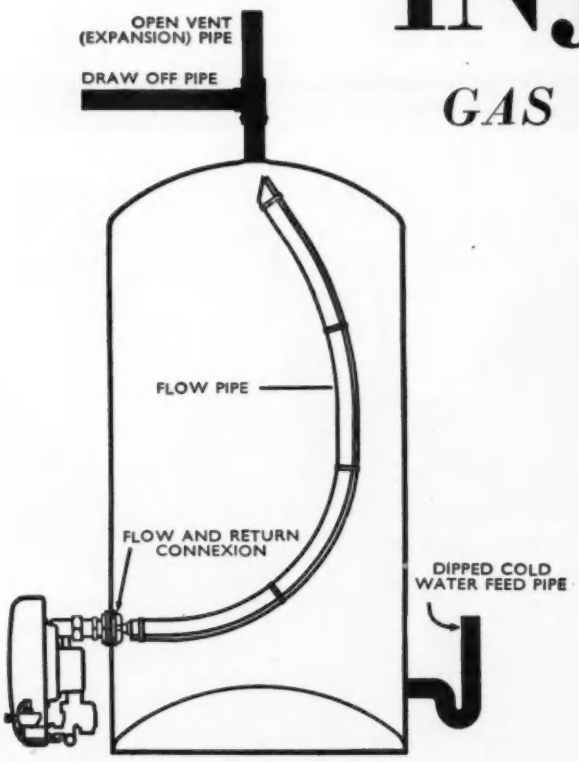
Woodall-Duckham House, 63-77, Brompton Road, London, S.W.3
Telephone: KENsington 6355 (14 lines) Telegrams: RETORTICAL (SOUTHKENS) LONDON

NEW WORLD leads the way

with the *STRATALYN*

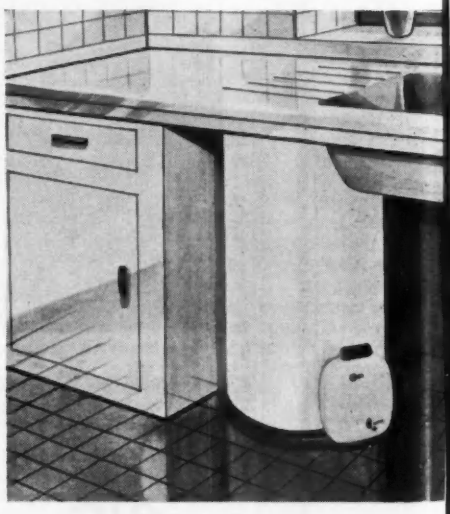
INJECTOR

GAS WATER HEATER



The **NEW WORLD Stratalyn** is a Regulo-controlled gas water heater for attachment to a storage cylinder or tank by means of a single water connexion. It is the gas application of the Immersion Heater.

The flow pipe terminates close to the top of the storage vessel and hot water is injected into the top ready to be drawn off. Mixing is avoided and the highest degree of stratification is attained.



✳ *Gas Rating* — 6,000 B.Th.U./hr.

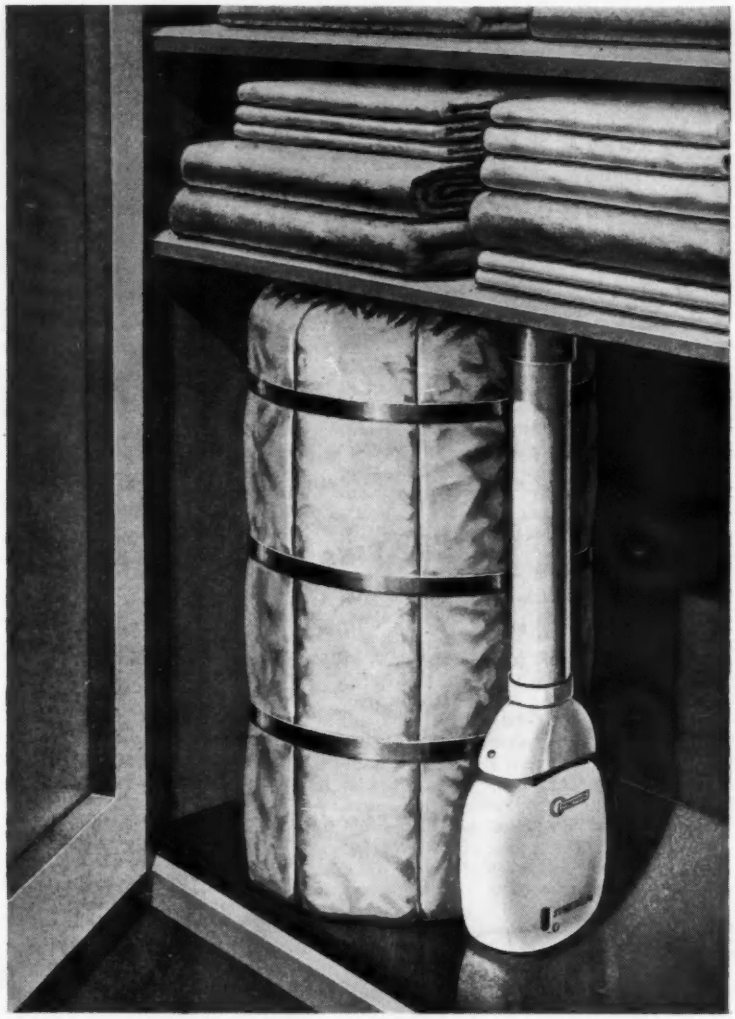
Output — 5½ gallons raised 80° F.

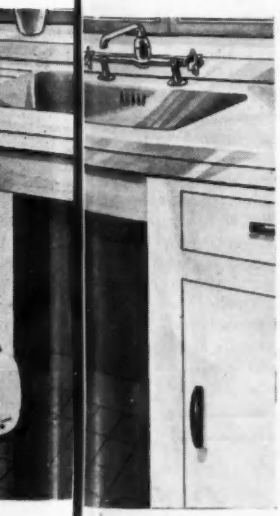
Complete with governor and T.C.O.

Available with flue cap or draught diverter.

Finished in white vitreous enamel.

RADIATION GROUP SALES LTD., 7 STRATFORD PLACE, LONDON, W.1





The NEW WORLD Stratalyn Injector Heater is

Inexpensive to buy
Economical to run
Cheap to fit, and will give maximum service with minimum maintenance

Fit and Forget

NEW WORLD
PRODUCT OF Radiation Ltd.

Water Heaters

Facts from the record

of Goodyear conveyor belting

STACKER

APPLICATIONS

A super quality belting for use where there is severe and frequent abrasion and flexing. It is ideal for conveying ores, stone, coke, glass cullet and other highly abrasive materials.

PHYSICAL PROPERTIES

Stacker exceeds British Standards Grade "A" in all requirements of fabric and rubber and may be used at temperatures up to 200 deg. F.
Made with the highest grade friction stock between plies for maximum flex-life.
Has the toughest cover obtainable, with the highest possible resistance to cutting, gouging and abrasion.
Completely inhibited against mildew damage.

AVAILABLE

Stacker is available in 28, 32, 36, 42 and 48 oz. duck weights, from 3 to 9 plies and in a full range of widths, lengths and cover gauges.

STYLE ORS

APPLICATIONS

For operations where extreme resistance to oil is necessary. Especially suitable for carrying oil-sprayed co
meat, fish or food where an

PHYSICAL PROPE

STYLE HRS

APPLICATIONS

Specially made for conveying hot, highly abrasive materials when the combination of resistance to high temperatures, extreme abrasion and severe flexing are essential.

PHYSICAL PROPERTIES

The carcass, cover and skim-coating between plies give all the heavy-duty characteristics of a Grade "A"

GOODYEAR
INDUSTRIAL RUBBER PRODUCTS

CONVEYOR BELTING · TRANSMISSION BELTING · V-BELTS · HOSE · FENDERIN

to employ rough fitters and to limit their field of action. Even so, practically all maintenance and renewals are carried out by our own labour, and this includes work on the following mobile plant: Five road tankers, two 200 H.P. diesel locomotives, two 14 in. bore steam locomotives, two coke lorries, two mechanical shovels and other plant.

We are fortunate in the Birmingham Division in that, by programming the working of the C.W.G. plant, it is possible for an average of six weeks each year to be allowed for the maintenance of each machine. At all other times, the machines are under fire and normally at work, but with the experience gained in the operation of automatic C.W.G. at the other Birmingham works over a period of many years, it is possible to carry out preventive maintenance in its strictest sense. All renewals to the C.W.G. plants are carried out by our own labour, with the assistant Engineer (old works) responsible for a suitable stock of spares being kept available, but in common with most gasworks, the absence of a suitable stores for handling heavy castings and major spares is the one big problem of this section. Even so, a very high standard of reliability is maintained on the C.W.G. plants, all of which have a high load factor, and this reflects great credit on those engaged in this task. Mechanical producer maintenance is carried out in the same way and it is the responsibility of the assistant Engineer (new works) to see that the producers are let down annually according to the boiler cleaning schedule, and make certain that an adequate supply of spares is always available.

Dustproof Barrier

Coke screen maintenance is always a problem. At the Swan Village works this has been aggravated by the absence of suitable labour, but at the new works it is greatly assisted by having two lines of screens separated by a corridor constructed of steel and glass partitions. The corridor forms a dustproof barrier between the two lines of screens and enables the maintenance men to work on the standing screen under good conditions. Where there are two sets of screens available, the replacement of wearing parts can be easily arranged, but at the old works, the screening plant is not duplicated, and there is little time between the draws for maintenance work other than the replacement of screen meshes. At each holiday shut down, the assistant foreman fitter arranges a comprehensive programme of maintenance and replacement to enable the screen to operate trouble-free until the next shut down. A good deal of attention has been directed to the reduction of wear on screen parts and machines because of the high cost of maintenance of this type of plant, so that, with the combined efforts of the engineering staff and the fitting section, the reliability of the screens is now very satisfactory. It is hoped that new techniques may reduce even further the maintenance problems and costs in this section.

The maintenance of conveyor and elevator equipment is quite a sizeable task at Swan Village, since there are five G.B., one L.B. and two tray conveyors with 25 belt conveyors and three skip hoists. Preventive maintenance of this type of equipment is still in its infancy, but the experience gained so far with one G.B. conveyor has proved conclusively to the fitting staff that a little inconvenience at the right time is more than amply repaid at a later date. Frequent checks are made on the pitch of the G.B. and L.B. conveyor chains to find out how much wear has taken place, and the Divisional Mechanical Engineer requests periodically that a section of chain be removed and dismantled so that the rate of wear on individual parts of the chain may be determined. With bucket axles, there is a danger of inadequate hardening of the axle ends and periodical Brinell hardness tests are advisable.

Any items requiring attention are reported in writing directly to the foreman fitter, with a duplicate copy to the Deputy Engineer for information, and, if necessary, the question of priorities can be considered at a weekly meeting with the foreman fitter.

The fitting shop at Swan Village is located in the old works and is equipped with machine tools. These machines include a mechanical saw, a radial drill, a vertical drill, two lathes, a planer, a miller, a blacksmith's power hammer, plate shears, a pipe screwing machine and grinding stones. It was intended to erect a fitting shop and stores at the new works, at a cost of about £100,000, but credit restrictions have forced deferment until at least 1959-60. In an attempt to improve the present facilities, however, which are by no means adequate because of the increase in size of the works, small sums of money are being spent on the re-arrangement of the equipment. Removal of the blacksmith's hearth and power hammer from the centre of the shop to an annexe has enabled a better deployment of drilling and sawing facilities and made more space available for work benches. Although these moves were primarily intended to give the plating section more space for setting out and fabrication, work is now in hand for the removal of the covered plating store some three hundred yards to a site adjacent to the fitting shop in order to reduce the time spent in material handling. When this is complete material will be handled directly from the store to the fitting shop by overhead rail track. Such arrangements take time and patience, but when completed, all the effort is amply repaid by the greater productivity. In order to overcome the restrictions imposed by limited equipment and available manpower, a quantity of machining has to be carried out by local firms and fortunately there are excellent services available locally for both plating and machine work at a reasonable cost, due entirely to the low overheads of the firms concerned.

Since regular lubrication is an essential for any efficient maintenance scheme connected with mechanical plant, six full-time greasers carry out scheduled greasing under the supervision of the plant examiner. It has been found in practice that the shift plant operators cannot be relied upon to perform greasing satisfactorily, which is no doubt due to the high turnover of shift labour, but with the advent of incentive bonuses it is possible that the operators will again be responsible for certain lubrication. Where key shift men are concerned, e.g., exhauster drivers, C.W.G. operators and booster attendants, lubrication is carried out satisfactorily by them, but, of course, the proportion of plant covered by this type of man is exceedingly small. At the new works, four automatic lubricators on the G.B. conveyors have given reasonable service but they require a fair amount of maintenance, since it is obviously essential that this type of equipment should be kept spotlessly clean to enable it to perform its function satisfactorily. Following a favourable report from the Windsor Street works, it was decided to use graphite lubrication on a 620 ft. long G.B. conveyor at the old works. This system, which is fully automatic, is in operation the whole time the conveyor is at work, and lubrication is so arranged that the oil is supplied to the chain at every seventeenth link. A very light oil, used as a carrier for the finely divided graphite, quickly evaporates, and a graphite coating is deposited on the face of all working parts. It is interesting to note that, after six hundred hours working only 10 gal. of the graphite lubrication oil was used, but even so, there is evidence of over-lubrication and it is hoped to halve the consumption. Previously, oil was merely poured on to the chain links, and for an equivalent period of running 100 gal. of lubricating oil, or waste oil if it were available, would have been consumed. A new chain is to be fitted to this conveyor at Easter, and its performance with this new type of lubrication will be closely watched.

The lubrication of all road vehicles, cranes and mechanical shovels is carried out satisfactorily by their drivers, who combine it under normal circumstances with vehicle cleaning on Saturday mornings.

Standardising Pumps

With the electrification of pumps at the old works, the opportunity has been taken to standardise the types of pumps used to limit the number of spares carried. The small gear type siphon pumps have been found to give twelve months' trouble-free running and so they are replaced annually by an overhauled pump, but the pumps at the liquor concentration and dephenolation plant are a heavy item of maintenance, and must be inspected daily and maintained as required. In the hope of reducing the pump maintenance needed in this section, mechanical gland seals are at present on trial.

Another item of maintenance requiring a great deal of supervision is that of boilers and this is especially true of the boilers at the new works, which have a working pressure of 350 lb. per sq. in. There is a total of 21 boilers comprising eight of the annular type, nine waste heat, two locomotive and two standby fuel-fired boilers which are rarely under fire. The boilers are prepared for annual inspection in accordance with the Factories Act, Section 29, and the inspections normally begin at the beginning of April and finish by the end of October each year. The boilers are emptied as soon as con-

venient and immediately washed down with a high pressure hose, and wherever possible, all trace of deposit is removed, but this is now most difficult in the case of boilers in the 250 to 350 lb. per sq. in. range because of the closeness of the tubes. The superheater tubes are examined and if there is any sign or leakage at the ferrules they are all changed and the joints remade. This policy, which has only just been adopted, has much to recommend it. Where economiser tubes are fitted they are cleaned out with mechanical rotary brushes and their bends refaced to enable a sound joint to be made. At the same time all boiler fittings are removed, repacked and made available for the insurance company's inspector, waste heat boiler fans are dismantled, the fan blades cleaned and the bearings checked for wear, and annular boilers are painted with an anti-corrosive paint, to inhibit the deposition of scale on the boiler surfaces.

The maintenance of electrical items at the works is the responsibility of two electricians who have leading hand status. One is allotted to each works, and in sickness or holiday periods a relief man is provided from the Birmingham works. These leading hands are responsible, through a visiting foreman, to the Divisional Electrical Engineer.

Preventive Maintenance Scheme

Except for one boiler feed pump, all prime movers on the new works and approximately 80% of the prime movers on the old works are electric motors. It will be appreciated, therefore, that the maintenance of electrical equipment forms a very important part of the works' organisation, and so a preventive maintenance scheme is in operation which permits inspection and maintenance to be carried out simultaneously.

The general inspection of individual switches of the high voltage 6.6 kV equipment is carried out approximately once a year, except where it is definitely known that the switch is being operated under heavy loads or fault conditions. If so, an immediate inspection will then be undertaken. Oil would only be changed if carbon is in evidence or the oil has darkened in colour. Contacts, other than those in oil, are normally coated with contact grease to discourage the formation of sulphides, oxides or attack by ammonia.

Where such a switch is used to control large horse-power motors (500 H.P.) and operates 'direct-on-line,' the carbonisation of the oil may be fairly heavy, but inspections are normally arranged to be made every 80 to 100 operations of the switchgear, equivalent to an inspection period of about three months. Every six months oil samples are withdrawn from the bottom of each power transformer and checked for insulation value and acidity. If the insulation value reaches the low limit of 20 kV the oil in the transformer will be filtered, or if the acidity reaches the high level of 1.0 mg. KOH per grm., it will be changed during the next summer period.

Medium Voltage Equipment

The general inspection of contacts of the medium voltage equipment are made one a year unless they are operated or have been tripped on load. The normal duties of the attendant consists of checking the heating of links and the switch cases. The routine cleaning of all brush gear, slip rings and commutator equipment is undertaken about once or twice a month. Commutators are watched for wear and when re-skimming is required it is normally done in such a position as to obtain the best commutation conditions. The cabling is normally observed for signs of heating, and cable joints for any sign of the running or washing out of the compounds by oil from cables or transformers. If this latter occurs, it normally indicates that the cable joints must be re-made and any oil leaks repaired by welding.

The Birmingham Division has standardised on a specially built direct-on-line contactor with thermal overload unit and single phase preventor mounted in a large robust cast iron case and similarly constructed HRC fused switchgear. In either of these equipments the load seldom exceeds 50% of its rated capacity, which reduces maintenance attention, and both are protected by means of substantial rubber gaskets. The most important drives are normally opened, inspected and blown out once a month and other drives about once every four months, but this routine programme is supplemented by separate and individual inspections of complete plants, as can conveniently be undertaken in normal programmed work. Totally enclosed motors, mostly to B.S. 2083, are used in a limited range of horse powers to be readily inter-changeable with stock motors. All motors are watched for vibration, especially when they are coupled through a fluid drive unit and, if vibration or heating should develop, motor bearings will be normally changed by outside contractors.

Cranes which are a very essential part of the normal operation of a gas works are inspected weekly, and carbon inserts are replaced on trolley wires about every two to three weeks. With the present tendency to use direct-on-line contactor drives with fluid couplings for long and cross travel drives, the maintenance of controllers is reduced and control gear simplified.

High voltage detarrer equipment and treaters are opened for inspection, cleaning, and the alignment of the electrodes on a yearly basis, but in some cases it is necessary to clean the insulator every three months if the detarrers are working under dirty conditions.

Each motor drive and item of switchgear is numbered with a plant number and any maintenance work or inspection carried out is recorded daily against the appropriate plant number. Card records are kept for each drive which give a complete history, and at the same time a visual indicating system is maintained with coloured flags to indicate the state of the maintenance programme at any time.

The number of men carried in the painting section is twelve, which includes the foreman. Five men are top rate painters, two painter improvers, and the rest are classed as rough painters. Although the standard of workmanship is high, only half the men can undertake chairwork with confidence. All types of painting are undertaken, including offices, gasholders, gantry cranes, etc., and great emphasis is placed on cleaning down all steelwork before the application of paint. Flame cleaning is used in damp atmospheres, as in conveyor trenches; and where severe corrosion has taken place pneumatic chipping hammers are used. It appears that the most effective way of ensuring that steelwork is properly cleaned down is to insist upon the application of a phosphoric acid rust remover after the initial cleaning down. The rust remover is purchased locally in bulk and is very economical when applied by an ordinary soft brush. Such precautions are most necessary with the high cost of paint.

Trials with Zinc-rich Paint

Three coat painting of structural steelwork has been practised in the Birmingham Division for many years. This consists of a red lead, silica graphite and finishing coat, and has proved satisfactory, but extensive trials are being carried out with a zinc-rich paint which it is claimed can be applied over rust providing that the loose material has been removed.

The building section comprises bricklayers, carpenters, slaters, concreters and scaffolders, to a total strength normally of about twenty men. Each class of tradesman has one man of leading hand status who is responsible to the head foreman.

The bricklayers undertake refractory repairs to the C.W.G. and producer plants, together with all routine work connected with continuous vertical retorts. Maintenance of boundary walls, pointing of buildings and small new constructional work completes their duties. At each bank holiday shut down, tiled lined chutes are repaired or renewed as is needed, since it is essential that this type of work should be carried out regularly to extend the life of these chutes as long as possible.

The slaters' work is greatly changing in nature because of the ever increasing use of corrugated sheeting. In the old works, where there are a number of roofs at least six years old renewals, as they become necessary, are normally by corrugated aluminium sheeting. The side sheeting of buildings, the inspection and cleaning of gutters are all carried out by the slaters. This latter is on a regular basis, and the period between the cleaning varies with the location of the gutters. Weekly inspection of all scaffolding is the responsibility of the leading hand in accordance with the 1948 Building Regulations, Section 20. Ladders, too, are inspected and reported upon by this leading hand, who keeps a register and obtains a signature for all issues.

Gasholder maintenance is carried out by the waterless gasholder attendant and a part-time assistant. A very rigid inspection and maintenance programme is insisted upon in accordance with the Factories Acts, 1937 and 1948. The attendant greases the rollers of four water-sealed gasholders

once per month, checks the water level in the cups and carries out inspections of the anti-freeze arrangements, which at this time of the year is carried out daily. Once a week the holders are inspected by the divisional gasholder foreman who reports on his findings to the Deputy Works Engineer.

Uses of Aluminium

Aluminium is now being used more and more for the construction of gas works plant and it is of interest to note some of the uses to which aluminium has been put at Swan Village. Both cast and fabricated aluminium buckets have been fitted to gravity bucket conveyors which are handling coal and coke. It is too early to report on the life of these buckets but it is clear that they are far more resistant to corrosion and cleaner emptying than mild steel and the comparative lightness of aluminium buckets is an enormous asset when buckets are being changed.

Aluminium sheeted (B.A.25. W.P. $\frac{3}{16}$ in.) floorboards have been fitted to two lorries which are used at the works for transferring coke to the C.W.G. plant. The life of these aluminium sheets has been found to be approximately four times that of the M.S. previously used.

Prefabricated aluminium scaffolding which is a third the weight of the conventional tubular steel scaffolding and far quicker to erect is being made use of and the advantage to be gained can be easily seen when a 19 ft. tower, complete with ladders, platform, etc., can be erected by one man in 10 minutes. Although such scaffolding does not reduce the labour employed for this work, a quicker turn-round of scaffolding equipment is possible which increases the men's safety when working at heights. This type of equipment is particularly useful for the lagging of overhead steam mains, painting, etc.

Extensive use has been made of aluminium corrugated sheeting at Swan Village, and this is shown by its use to roof a garage with a total area of 5,600 sq. ft. of sheeting, and the re-sheeting of an existing coke screening plant of both roof and sides. In every case 22 gauge aluminium sheeting B.S.S.1470 NS.3 was used.

Longer Life for Dead Plates

Aluminium plate to B.S.S.1470 NP.5/6N. has been used on the coke screens for dead plates for three years. These screens are of the horizontal reciprocating conveyor type, and suffer from excessive wear on the dead plates. By substituting aluminium dead plates in screens of this type, a life three times that of M.S. has been realised, and its lightness is responsible for a considerable saving in power. Compared to the M.S. dead plates for one screen which weighed 1,560 lb., the equivalent aluminium plates weighed only 690 lb.

Although aluminium has proved itself most useful on coke screening plants, other experiments are in hand and these include rubber screen dead plates, and rubber bonded screen meshes, and even two meshes of vitreous enamelled at a cost of under £1 have been experimented with.

Some of the heaviest items of maintenance at the works must surely be those of chutes and hoppers. Experience has shown that the use of cast basalt tiles on those sections of the chutes which receive most wear, that is points of impact, together with blue tiles provide the most satisfactory lining. The tiles are set in ordinary Portland cement composition or Ciment Fondu, depending upon the time factor, but where vibration is likely to occur a plastic cement of a latex base should be used. Coal and coke hoppers are normally treated by the Gunite process, as is well known to most engineers, and so satisfactory has this type of application proved in Birmingham that a full-time Gunite gang operates in the Division. The case of the original coal receiving hopper at the old works is of interest. Here renewal was necessary due to general deterioration of the steel plates and rivets and because other equipment was suspended from the hopper. The hopper had been gunited on the inside at a late stage in its life, and the lining was in very good condition. Had this action been taken when the hopper was new, and protection given to the outside of the hopper, no renewal would have been necessary. The replacement hopper, therefore, has been zinc sprayed on the outside, and lined on the inside, and this it is felt, will give the maximum protection.

The use of borehole water with its acidic content at Swan Village has caused galvanised tubing, which was installed during the construction of the new works, to fail after two and a half years. To overcome this problem, polythene tubing with copper fittings have been used on a ring main for 16 retorts. When this was installed, polythene fittings were not available, but they have since come on to the market and it is proposed to try this type of fitting. During the manufacture of these fittings, two metallic rings of resistance strip are moulded into each section. Two leads from this element project from the end of the fitting and are used as electrical connections. A current, supplied from a heavy duty six volt car battery for approximately 15 to 30 seconds, locally heats both the fitting and tube around the metallic ring and effects a weld of the tube and fitting.

Traction type fluid couplings are extensively used at the works for electric motor couplings, and their use makes possible direct-on-starting with squirrel cage motors, together with the simplification of electric equipment and lower maintenance costs. One characteristic of the fluid coupling is that at a predetermined load the coupling can slip and avoid any mechanical overload. As the coupling slips, heat is generated within itself and causes a fusible plug to blow and the oil to drain from the coupling, which isolates the motor from the driven member. Variable speed fluid couplings are also used where a range of speed is required. The amount of slip can be varied at will from 100% at starting, when the driven member remains stationary, to varying degrees by the operation of the coupling control gear and it is possible to transmit 96% of the motor speed to the driven member. The chief advantage to be gained by the installation of this type of coupling is that constant speed motors can be used and the need for complicated variable speed equipment avoided. Variable speed fluid couplings may be applied to boiler feed pumps, waste heat boiler fans, exhausters and boosters.

At Swan Village, a preventive maintenance scheme to cover both works was introduced prematurely and was unfortunately ineffective, but the same scheme is now being re-introduced gradually, and at first it will run in conjunction with plant examination, although at this stage it is impossible to say to what extent the preventive maintenance scheme will replace plant examination; some modification of the latter will be necessary. The scheme makes necessary the inspection and maintenance of items of plant by the fitters themselves, on a strict time schedule, and these inspections will have to be reported and the comments noted on a card, in the same way as the electrical record system. Each card will also indicate details of spares on order and available, and a visual indicator board with coloured flags will record the state of the plant. The record cabinet and indicator board will be kept in the foreman fitters' office.

Successfully to operate a maintenance scheme for mechanical plant is a much more complicated affair than that for electrical plant. This is clearly shown by comparing the time needed for a thorough examination of a high speed reciprocating steam engine which would take a fitter approximately two and a half days, since it is necessary to open up and strip the engine for inspection to ascertain the extent of wear on bearings, piston rings, cylinder bore, slide valve gear, etc. A similar inspection for an electric motor drive and switchgear would probably take two hours.

Reduction in Requirements

By electrification of the old works which has proceeded steadily for the past three years, there is no doubt that there will be a reduction in maintenance requirements and a more efficient use made of the power services. All surplus steam at this works will be used for electric power generation.

The pooling of spares is to receive more attention in the future in an effort to reduce idle capital. At the present time, this is only practised to a limited extent in the Birmingham Division, and includes fluid couplings, certain C.W.G. plant items and retort ironwork, but the problem of retort ironwork spares is being simplified by the standardisation on a retort of 82 in. major axis.

European Coal Community Celebration

The fourth anniversary of the European Coal & Steel Community's six-nation common coal market took place on February 10. Final details of a common market for all goods in those countries are now being worked out.

D

From a paper to the Midland Junior Gas Association, December 11

Gas is Competitive

By A. HIGGS, M.Inst.Gas E., M.Inst.F.
ASSISTANT INDUSTRIAL GAS OFFICER, WEST MIDLANDS GAS BOARD.

THE industrial gas load in the area served by the West Midlands Gas Board has shown a consistently steady increase since vesting date. Statistics show that in total the Board's industrial gas sales have increased by 38.3%, which is made up in the individual divisions as follows:

TABLE I

Division	Industrial gas sales 1,000 therms		Increase %
	1949	1955	
North Staffordshire	22,680	36,986.9	63
Wolverhampton and District	13,174	18,078.3	37.1
Walsall and District	22,898	26,062.6	13.8
Birmingham and District	42,958	57,568.2	34
Warwickshire	11,638	16,247.3	39.6
Worcestershire and Herefordshire	5,255	9,052	72.3
Shropshire	799	1,154.7	44.5
Total	119,402	165,150	38.3

This is no mean achievement if the substantial increases that have taken place in the price of town gas are borne in mind. Such increases have inevitably widened the gap between the net cost of gas compared with competitive fuels and electrical energy, but emphasise the 'amenity' value attributable to town gas-firing, a factor which is still perhaps underestimated. This may be supported by the trend over the last few months for manufacturers who use producer gas, and to a smaller extent, fuel oil for certain processes, to change over to gas-firing. The examples quoted in this paper will give some indication of the scope and magnitude of the business which is being obtained by this change-over to town gas.

The Birmingham Aluminium Casting Co. (1903), Ltd., Smethwick, manufacturers of high quality die-casting of numerous varieties, have always been large users of town gas for automatic die-casting and other plant, but have used producer gas-firing for their larger process plants. This producer plant comprised three Power-Gas mechanical grate producer units, each of which was capable of gasifying 12 tons of coke per day, and was provided with dust removal and washing units. The weekly coke consumption varied between 110 and 150 tons, with a yield of gas per ton of coke gasified from 200 to 230 therms. Careful records which were kept by the Chief Engineer's Department of this firm, showed that the average cost of producer gas, allowing for labour charges, capital depreciation, water and water softening costs, ash removal, insurance, maintenance and general repairs, was between 11.5 and 12.0d. per therm.

Town Gas Trials

At first glance, this cost showed that town gas was not competitive, but it was evident to the Divisional Industrial Gas Officer that improvements in thermal efficiency of certain items of producer fired plant could be made with town gas firing and so, with the ultimate objective of obtaining the total load, arrangements were made to carry out trials on certain items of plant with town gas. The results from these trials were so satisfactory that Birmingham Aluminium Casting Co. (1903), Ltd., decided to convert the whole of the plant to gas-firing. This conversion might appear to be simple enough on paper, but it was no mean task since it involved the modification of 1,068 separate items of equipment all of which required alterations or adjustment of some kind.

The maximum hourly consumption which was the result of this new business is 210,000 cu.ft., equivalent to an estimated additional annual load of from 350 to 400 mill. cu.ft.

The large holding pot furnaces of 675 lb. capacity had to be re-designed to operate efficiently with town gas. In actual practice on test, the re-designed furnace has a consumption of 28 therms of town gas per 24-hour day, as against 48 therms of producer gas. Fig. 1 shows that the town gas-fired furnace employs multiple air-gas proportioning burners firing along the inner arch, with the products of combustion travelling by way of the annulus between the double arch, which minimises heat and flue losses and contributes to the optimum thermal efficiency. Insulating refractory material was substituted for hard firebrick in the furnace structure wherever practicable to reduce thermal capacity and heat loss. The use of air-gas proportioning burner equipment ensures that the initial high thermal efficiency is maintained since the control of the air-gas ratio is taken out of the hands of the operatives. Air-gas proportioning burner equipment was also used for the conversion of the other holding pot furnaces.

Apart from the wide use of air-gas proportioning burner equipment, and the use, wherever practicable, of automatic temperature control gear, all possible means have been taken to reduce waste. All the torches (there are 605 of these and all prolific wasters of fuel if not properly controlled) are fitted with a ball valve designed by the Chief Engineer's Department and so arranged that the torch will only operate on full consumption when inclined towards the work, so that the action by the operator of hanging up the torch, automatically cuts off the gas supply.

Four sand driers, which were converted to gas-firing, were manufactured by Pneulec, Ltd., Smethwick, and are of the inclined revolving cylindrical type arranged with automatic sand feed by small independent bucket elevators. They are heated by aerated burners operating under induced draught from an exhaust fan.

Not So Effective

When these units were first converted, however, the heating was not quite so effective with town gas and Amal injectors fitted to open ended pipes, as compared to the original producer gas burners. This was attributed to the lower velocity of the combustion products, since the producer gas, apart from being supplied at 21 in. w.g., produced on combustion a larger volume of gases and so a higher velocity through the driers. This was put right by shortening the combustion chamber by moving the burners inwards towards the discharge end of the driers, which minimised heat loss and made full use of the radiation of the flames now developed within the driers.

Many items of plant, such as the core drying ovens and core drying racks, which employ natural draught burner equipment, were converted and new injectors and new burners were fitted so as to afford the correct burner port area and good combustion conditions. When the decision was taken to convert this plant to town gas-firing, an undertaking was given that the work would be carried out and completed during the annual holiday period, July 27 to August 13, and this promise was kept.

To enable a gas supply to be made, an 18 in. high pressure main was laid from the Birmingham Swan Village distribution system, and a 150,000 cu.ft. per hour Connersville meter installed—later to be replaced by a 250,000 cu.ft. per hour meter and a 16 in. high/low pressure service governor. On the outlet side for distribution throughout the factory, the producer gas mains, varying in size from 30 in. downwards, were utilised, but a careful examination was made of these mains and, where necessary, sections were renewed, and the whole mains system was cleaned out. The 18 in. high pressure town gas main was laid by Whittaker-Ellis, Ltd., which also carried out the connections to the Connersville meter. The

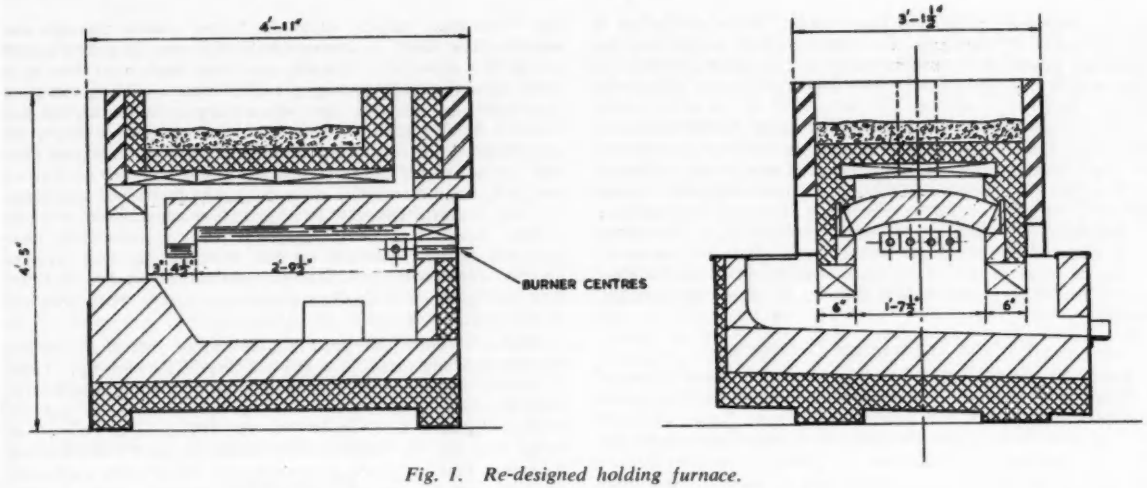


Fig. 1. Re-designed holding furnace.

work on the outlet side was carried out by the Horsley Engineering Company of Walsall, but the internal pipe installations, which connected the various items of plant, were carried out by the Chief Engineer's Department of the Birmingham Aluminium Co., Ltd., in conjunction with the Brightside Engineering Co., Ltd.

When completed, the whole of the main and outlet system was purged by two W. C. Holmes portable inert gas generators and town gas fed in.

As certain departments require gas at a higher pressure for die-heating and for some of the torches used for mould drying, two boosters were installed. One was rated at 50,000 cu.ft. an hour, with a pressure increase of 30 in. w.g., and the other had a rating of 30,000 cu.ft. an hour and pressure increase of 8 in. w.g. For air supply to the air-gas proportioning burner equipment, 12 Bivać air blowing fans were installed, providing air at 2 lb. per sq. in. The air supply line to the various shops was arranged on the ring main principle with a feed in at various points to allow flexibility in the use and servicing of fans, which could be carried out without interruption of production. Back pressure valves are fitted to each individual furnace which uses air blast.

There is always an automatic increase in thermal efficiency when producer gas fired process plant is converted to town gas, because the flue loss is reduced, due to the much lower 'inert' content and the high flame temperature of town gas by virtue of its higher calorific value. The saving from flue gas loss is dependent on the temperature at which the plant operates, and in high temperature furnaces it can be quite appreciable. In this particular case, of holding furnaces controlled at 620°C., the saving amounts to some 3% of basic thermal input, but in actual practice, most firms are interested in overall production costs which can be affected by a number of factors. Interruptions in production caused by inadequate gas supply from the producer can be very costly on machines producing hundreds of die-castings every hour, and difficulties connected with the peak demand, such as that on a Monday when the furnace plant is bsing heated up or difficulties caused by variations in production causing awkward demands on the producer gas plant; all these difficulties vanish when such furnaces are fired by town gas.

Sterling Metals Ltd., Nuneaton, are producers of high-grade ferrous and non-ferrous castings and, up to 12 months ago, were large scale users of producer gas. Their requirements were provided by three mechanical producers manufactured by the International Furnace Equipment Co., Ltd., which included gas washing and scrubbing. The gas was fed through 24-in. mains to a large variety of ovens, furnaces, etc., and its cost, including maintenance, etc., and coal at 70s. per ton was estimated at 11d. per therm.

To carry out the conversion, the existing underground producer gas mains were used. During the conversion, which was done in stages, the mains were blanked off section by section and town gas was connected after the appropriate alterations

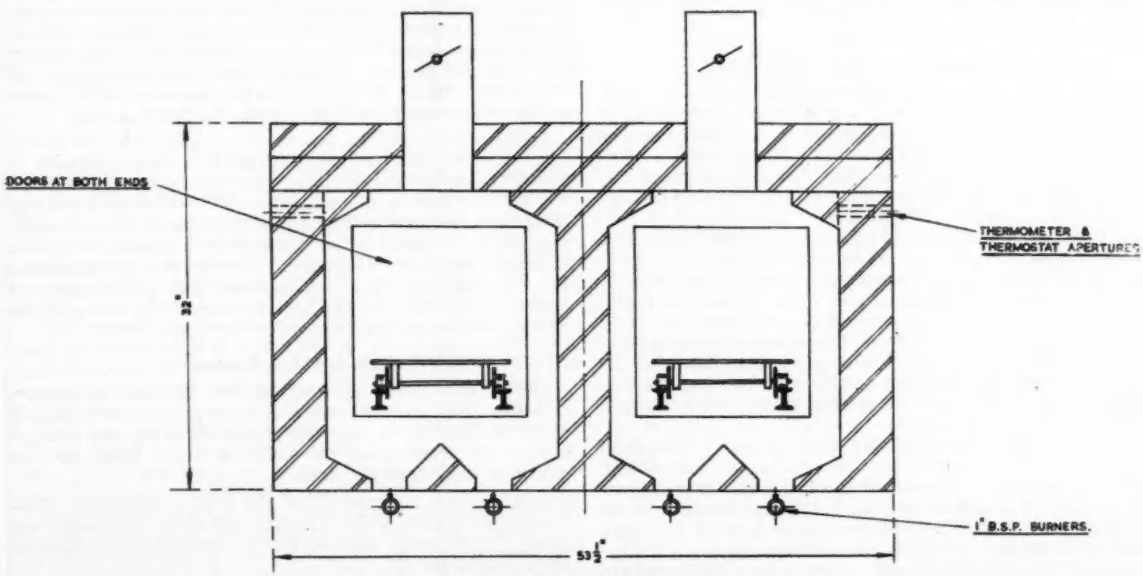


Fig. 2. Shell moulding oven.

to the individual plant had been made. This installation is fed by an 8 in. high pressure main at 10-15 lb. per sq. in. governed down by a Jeavons high/low pressure governor to 5 in. w.g. and metered by a 65,000 cu.ft. per hour Connersville meter.

One of the first conversions was a large cylindrical water tank, 4 ft. diameter by 11 ft. 6 in. deep, used for the quenching of large castings. The opportunity was taken by the industrial staff of the Warwickshire Division of improving the thermal efficiency wherever possible, this being done, in this instance, by arranging an insulating refractory jacket around the setting to a suitable height below water level. The heating is by means of three drilled 'Brayshaw' burners fitted in the base, and the solution in the tank is kept at 200°F. by thermostatic control.

Uniform Temperature Distribution

Two indirect fired ovens, 8 ft. by 4 ft. by 4 ft., were converted by simply replacing the producer gas burners with properly proportioned drilled bar burners fed from Amal injectors. In this same shop, a new 'Mivoc' oven, manufactured by the Modern Heating & Ventilating Co. Ltd., of Great Charles Street, Birmingham, was connected up en route. This oven, 8 ft. by 5 ft. by 5 ft., is arranged so as to give a very uniform temperature distribution throughout the working space. This is achieved by employing forced convection from a large unit air heater fixed on top of the oven, fired by Keith Blackman suction burner with full electronic flame failure protection and thermostatic control, with the gases discharging into a flue covering the entire top of the oven. The discharge from this flue, which is vertically downwards into the working space, is controlled by small slide dampers over the entire top of the oven. Although this arrangement is not by any means new, it does in this instance give very accurate control over the heat input across the oven by means of the extensive provision of control slides. A similar arrangement of slide dampers across the sides of the oven at base level balances the offtake for re-circulation purposes, and so ensures that the 'plaster of Paris' precision cores dried in the oven have uniform treatment irrespective of position.

Two ovens (incidentally, previously electrically heated) for shell moulding, 8 ft. by 4 ft. by 4 ft., were reconstructed to a design by the Industrial Department of the Warwickshire Division. A section showing the construction is shown in Fig. 2.

In the casting shop two ovens, one 12 ft. by 6 ft. by 6 ft. and one 6 ft. by 6 ft. by 6 ft., for heating miscellaneous cores to 450°C. were converted by fitting new burner equipment with full flame failure protection. The same technique was employed in the fettling shop for the conversion of eight brick built ovens, 5 ft. by 4 ft. by 4 ft., which are used to pre-heat castings to 280°C. before welding up any small defects, and to two more ovens, 6 ft. by 3 ft. by 3 ft., which are used for drying polishing 'mops.'

New Gas Heated Plant

In the metal re-claiming shop, town gas replaced producer gas for the pre-heating of four hot metal receivers used for casting ingots, and in the foundry, three sand driers of the gravity feed type were converted by fitting 1 in. Hypact burners, together with a large number of neat gas hand torches. New gas heated plant installed in the foundry includes two Mivoc conveyor ovens, 20 ft. long by 7 ft. 3 in. wide by 3 ft. high, which are directly heated by nineteen drilled bar burners located under the conveyor, with each burner fitted with independent flame failure control. These ovens are used for drying the 'blacking' on cores, and all the gas burner equipment for them was made on behalf of the manufacturers by the Industrial Department of the Warwickshire Division. Six ladle heating installations with a capacity when heated of 20 to 30 cwt. were also converted by means of 'Vortex' burners, utilising air at 6 in. w.g., with the burner equipment arranged overhead on swivel mountings.

This firm is laying down what must be one of the most up-to-date continuous production foundry plants in the world, which is entirely automatic and fitted throughout with conveyors, and the ingenuity of our industrial colleagues in the Warwickshire Division has contributed to resolving a heating problem connected with this 'automation' plant.

As the 'copes' and 'drags' pass along the conveyor, arrangements are made whereby the 'drags' are heated for five 18 second periods, while the 'cope' passes through unheated. The 'drag,' or bottom half of a moulding box passes along the conveyor inverted, and the core box, which is fitted with two pegs operating two plunger switches, energises a solenoid in the gas pipe which supplies eight drilled bar burners fitted across the conveyor; each burner is lit by an independent pilot. Heating continues for 18 seconds, and then the 'drag' moves on one position. The 'cope' or top of the box, follows it and, since it is not provided with pegs, the gas burner equipment at this station remains off and the 'drag' remains unheated. The 'drag,' meanwhile, has operated plunger switches on the next station, and receives another 18 seconds heating; this continues over five stations, with a total of 90 seconds heating in all, and is quite adequate to dry the blacking coat.

Ratcliffe (Great Bridge) Ltd., Tipton, are one of the largest producers of high-grade non-ferrous strip in the country. Until a few months ago producer gas from two Gibbons-Heurtey mechanical grate producers rated at 42,500 cu.ft. of gas per hour each, at a C.V. of 145 to 150 B.Th.U. per cu.ft., was being used for the firing of their annealing and billet heating furnace. This producer gas, which was made from anthracite at 228s. per ton for its low sulphur content, was washed, cleaned and used cold. With a weekly anthracite consumption of approximately 22 tons, the cost per therm, excluding capital depreciation, maintenance, water, insurance, steam, etc., was 18.24d.

On the advice of the Divisional Industrial Gas Officer of No. 2 Division, the firm converted one furnace, 22 ft. deep by 6 ft. wide by 3 ft. high, from producer to town gas-firing, as a trial, and were so pleased with the improved results, accuracy of temperature, ease of control and consistency of product, that they decided to convert all their furnaces to gas heating.

Annealing Brass Sheets

Four such furnaces were subsequently converted, and are used for annealing brass sheets varying in thickness from .750 in. to .070 in. thou. The process, which varies somewhat according to material specification, is briefly to insert a load of eight tons by mechanical charger into the furnace at a temperature of 750°C., and allow it to soak to this temperature over a period of three hours, followed by withdrawing and quenching in water. The temperature of the furnace drops from 750° to 650°C. when the cold load is charged. The furnaces are fired by nine burners on each side of the nozzle mixing air-blast type, and are fitted with a stainless steel inner and outer tube with air blast at 20 in. w.g. Overfiring is employed, with the products of combustion passing down under the hearth through flues positioned between the burners, and a slightly oxidising atmosphere is maintained. The furnace is hand-controlled by operators who are quite skilled in maintaining the uniform temperature along the working length of the furnace. In practice, annealing temperature varies between 500° and 700°C., with the gas consumptions averaging 2,200 cu. ft. per hour at 500°C., 3,000 cu.ft. per hour at 650°C., and 3,500 cu.ft. per hour at 700°C. with an eight ton load.

Billet heating, or the heating of copper slabs 18 in. by 13 in. by 4 in. deep and weighing 300 lb. to a temperature of 850°C. is carried out in an inclined hearth furnace designed by Ratcliffe Ltd., and installed in 1943. Here two rows of these slabs are pushed down the inclined hearth on heat resisting castings, running in four troughs, by a mechanical pusher manually operated. The man at the rear end is responsible for inserting the slabs and operates the pusher gear, as necessary, by observing the rate of 'take-off' by the operators at the front end of the furnace.

Ten Air-blast Burners

The furnace which is fired by ten air-blast burners on each side firing over the arch with waste gases being exhausted under the hearth to an underground flue, has an average hourly gas consumption of 4,200 cu.ft. per hour, and an output of three tons per hour.

Starting from the brass billet, the strip is reduced in thickness progressively, which involves re-heating full annealing between each rolling stage so that the demand on the furnace plant is quite heavy.

A conversion from producer gas and fuel oil heating has

been carried out at a large tile works in the Stoke-on-Trent area, where originally three biscuit kilns were fired by producer gas from two 8 ft. diameter Wellman Smith Owen Galusha mechanical producers with anthracite as the fuel, and fuel oil burning equipment as a standby.

Subsequently, producer gas was superceded by fuel oil, but over the last 18 months, after investigations by the industrial section Stock-on-Trent, the fuel oil to one of the continuous kilns has been replaced by town gas.

In practice, the cost of town gas-firing works out at approximately the same as that of 200 seconds medium grade fuel oil after due allowance has been made for reduced maintenance on the burner equipment and exhaust fans. With fuel oil the burners needed cleaning at least once a week, and took a man 30 to 40 minutes for each burner, while the hot gas fan had to be stripped down once a month. On town gas, no such maintenance is required for the gas burner equipment, while one hot gas fan serving a town gas kiln has not been serviced for 18 months to date. There is, therefore, an appreciable saving of maintenance costs.

Pre-heated Air

Taking one kiln as an example, the gas burner arrangement is extremely simple and comprises a ¾ in. gas pipe terminating in a heat resisting steel nozzle which is located in a venturi burner block to minimise back radiation, with ⅛ in or $\frac{13}{64}$ in. holes which direct a jet of high pressure gas underneath the truck base. The air for combustion is effectively preheated by drawing it from the cooling zone down the kiln, where it is heated to 1150°C. by coming in contact with the ware being fired. This particular kiln has a total of 230 burners, and is divided into eight zones each under separate control, with three zones controlled automatically by 'two position' temperature indicating controllers. Natural draught type burners are fitted at higher levels into brickwork recesses in the side wall and the arch to avoid flame impingement on the ware.

This kiln with a gas consumption of 14,000 cu.ft. per hour deals with 29,000 yards of biscuit wall tile per week. It accommodates 72 cars, which is a day and three-quarters throughput of 46 cars per day, each of which is 5 ft. 6 in. long with a placing space of 3 ft. wide by 4 ft. 2 in. high, with each truck holding 97 saggars. The total area of tiles per truck is 90 yards.

The chief engineer of this works has made very full use of all the surplus heat from the cooling zones of these continuous kilns. All the cooling zones are operated on the indirect cooling principle with surplus heat collected by hot gas fans and distributed by ducting. This heat is sufficient to meet the entire space heating requirements of this firm's No. 2 works. At their No. 1 works 50% of the space heating requirements have been supplied in this way to date, although it has just been augmented by the construction of a heat exchanger to utilise the heat available from the combustion products. This has made available a further 6,000 cu.ft. a minute of fresh air heated to 85°C. for space heating purposes.

At their No. 1 works gas is now used for four continuous tunnel kilns; one 'bisciut' is open fired and three glost kilns are muffle fired. At their No. 2 works gas is employed for two glost kilns, one of which is of the muffle type and the other with open flame for saggared ware. Gas is also used for supplementary processes, particularly for research in the laboratory on experimental frit and colour firing, etc., and in the canteen.

The annual consumption at both works is 460 mill. cu.ft., with a maximum hourly demand at No. 1 of 45,000 cu.ft. and at No. 2 of 17,000 cu.ft. The kilns at the No. 2 works were also originally oil-fired, but have recently been converted to gas-firing.

The gas is supplied at the No. 1 works through two 35,000 B.M. meters, and is boosted at the outlet to 24 in. W.G. by a 95,000 cu.ft. per hour Keith Blackman fan booster, with an identical booster as a standby.

Earl Bourne and Co. Ltd., Birmingham, produce brass and copper tubes, strip and rolled metals on a large scale, and in infinite variety and until a few years ago their process plant was mainly fired by fuel oil and solid fuel. In 1955, however, they installed two furnaces of identical size for the annealing of strip and coils, one heated by town gas and the other by electricity. These furnaces, 20 ft. deep by 5 ft. wide by 3 ft. to the spring of the arch, with an annealing cycle of two hours take a load, charged mechanically, of five tons. The temperature varies from 550 to 700°C., according to the particular alloy being treated, but the bulk of the work, however, is carried out at 580°C., and the most common size of strip dealt with is 20 ft. long by 16 in. wide by ¼ in. thick. Although the 16 in. coils may vary from ¼ in. down to 20 gauge, each coil weighs the same at 650 lb. The gas consumption of the furnace averages 2,300 cu.ft. per hour, equivalent to a gas consumption of approximately .41 cu.ft. per lb. of material charged.

The gas furnace is of the Incandescent Heat Company's deep recuperative type. It is fitted with twenty natural draught burners on each side, and automatically controlled by two 'Electroflo' fully floating temperature controls which operate hydraulic control valves. These jointly increase or decrease the gas supply with corresponding adjustments to the flue damper system, with the result that the temperature distribution along the furnace length is extremely uniform.

The electrical furnace is of identical dimensions, with electrical resistance heating and full temperature control, but its capital cost if the transformer and wiring are included, works out at five times that of the town gas installation.

In actual practice, the running costs of the town gas furnace are slightly less than the electric one, and the finish obtained is better, since there is less scale, so a second Incandescent Heat gas-fired furnace of identical dimensions and specification has just been installed.

On the question of the merits of gas and electrical heating one of the points made by the foreman of the heat treatment shop, and his views are of some importance, is that in the event of failure of the electrical supply the gas furnace can still go on and complete the heat treatment cycle by hand control, whereas the electrical plant is completely shut-down. In the piercing and extrusion shop also two large billet heating furnaces have been converted from fuel oil-firing to town gas-firing.

Here the opportunity was taken to improve the efficiency of application, with fuel oil of 900 seconds viscosity, end firing was employed on the inclined hearth furnaces with the burners at the offtake end, but this has been dispensed, and gas-fired side burners of the concentrated combustion type have been installed.

A piercing furnace, 17 ft. by 4 ft. heats 2½ in. diameter copper bars 40 in. long weighing 70 lb. to 850°C. Here the burners are the four tunnel concentrated combustion type units, three of which are fitted on each side. Fully automatic temperature control is used on both furnaces with motorised-valve-operating control valves on both the gas and the air lines.

Typical Performance

Typical performance figures for the piercing furnace are as follows:—

Temperature: 850°C.
Output: 9 tons 14 cwt. 28 lb.
Gas consumption: 23,790 cu.ft. over ten hours including pre-heating.
Average gas consumption per lb. of material treated: 1.12 cu.ft.
Temperature: 870°C.
Output: 10 tons 8 cwt. 84 lb.
Gas consumption: 23,420 cu.ft. over ten hours including pre-heating.
Average gas consumption per lb: 1.2 cu.ft.

Earl Bourne and Co. Ltd., were so pleased with the results of the gas firing of this piercing furnace that they converted an inclined hearth extruding furnace 28 ft. by 5 ft. to gas firing. This furnace, which deals with 7 in. diameter billets 10 in. long, was equipped with six 10-tunnel c.c. burners, three fitted on each side, with air for combustion at two lb. per sq. in.

All the furnaces are fitted with separate rotary meters, and a very careful check is kept by the general manager of costs on each particular piece of plant.

These are a few examples of loads that are being gained from producer gas-firing. There are others which might be mentioned. Such as a large tube works which could take a load of 450 mill. cu.ft. of town gas a year if 16 Priest regenera-

tive furnaces, 30 ft. deep by 6 ft. wide by 3 ft. high, were converted, another is a large firm producing die-castings which, it is estimated, could take a further 200 mill. cu.ft. per annum, and yet a third is a firm using producer gas for plate heating in regenerative furnaces.

Considerable attention is also being paid to fuel oil users, and enquiries on hand for conversion include a sanitary works, with a gas requirement of about 350 mill. cu.ft. per annum, and from several large and small firms which use fuel oil for forging work on continuous and batch type furnaces.

Technical Advisory Service

The Board Industrial Department provides a general supporting technical advisory service to the divisional industrial staff and to consumers, and it may be of interest to mention that, during the last 12 months, approximately 200 designs for special plant or for proposals for conversion from other fuels to gas firing have been handled by the Department. As well as preparing such designs, and the specifications that go with them, there are full facilities in the development laboratory for carrying out any tests that may be needed and at the same time full use can be made of the Board's heat treatment department at Birmingham and Coventry to deal with consumer's enquiries. Well equipped workshops are available for the fabrication of proto-type plant, burner equipment, etc.

Here are some of the typical jobs which have been dealt with by the Industrial Department: The conventional methods of drying size on the back of carpets in continuous productive lines is to pass the carpet over a steam-heated drum of about 12 ft. diameter and assist the drying by applying forced air convection on the pile side of the carpet. Some years ago, experimental work was carried out by the Yorkshire Industrial Gas Centre, Ltd., and the Halifax Gas Department, on the application of radiant heat to this process, and a complete installation was installed at a Halifax works after vesting date by the North Eastern Gas Board. Recently, a modified version of this plant, with improvements, has been designed by the Board Industrial Department for a Kidderminster works and comprises nine radiant heating units, arranged so that the combustion products from a drilled bar burner, throwing a flame over the refractory, are drawn through an insulating refractory by an induced draught hot gas fan. These waste gases are used to complete the drying of the size by low temperature convection. The form of construction of the drying chambers is perhaps worthy of mention in that 'Marinite' insulating board is fitted to channel sections with an inner steel liner on which the 'spouts' or discharge ports are fitted. Apart from these low temperature drying chambers, which differ in method of application of the hot gases, another improvement lies in the burner arrangement which is provided with a device whereby the burner operating width can be reduced from 3 ft. to 2 ft. 3 in. This is achieved by means of the piston mechanism.

Protection from Damage

The surface temperature of the radiant emitters is 1,050°C., and the carpet speed possible is expected to be five times that attainable with steam. Provision is made to shut off the gas and to protect the carpet from damage in the event of conveyor stoppage by the provision of asbestos shields, which may be released by solenoid latches and so arranged as almost to instantaneously move between the carpet and the radiant emitter in case of emergency.

The design of a heat treatment furnace has been modified to give a more uniform temperature distribution for the tempering of small tools, and the method adopted was to use a small unit air heater of a type developed by the department, with a rated capacity of 600 cu.ft. per hour, and specially treated with Follsain to withstand temperature. The products of combustion are circulated at fairly high velocity by a hot gas fan with a bleed to atmosphere sufficient to ensure the necessary intake of fresh air for combustion. This unit operates at a temperature of 450°C.

A conveyor oven has been designed to replace a treble-cased box oven previously used for curing paint on small components of irregular shape. This design was evolved as a result of three explosions which occurred in quick succession in this treble-cased oven; fortunately no one was fatally injured, but it was quite evident that solvent vapour concentration within the inflammable limits were continuously forming in the oven when stoving was taking place. The present design eliminates this possibility by providing enough air to keep the solvent vapour below the lower inflammable limit, and at the same time abnormal conditions are guarded against by an explosion relief running the whole length of the top of the oven. This takes the form of a 2 in. thick Caposil roof, supported at each edge, and sealed by aluminium foil after the design based on the work of the Gas Council No. 2 Research Station and reported by Simmonds and Cubbage.

The usual flame failure controls and air flow switch are provided and the oven is more economical.

The attainment of high thermal efficiency is of the utmost importance to us in our quest for new business and in load consolidation, and much can still be done in this direction.

When a furnace is operating intermittently, there is an optimum wall thickness which is arrived at after consideration of the hours of use, temperature, operating cycle, hearth loading, etc., and experience shows that too heavy a construction and over insulation can be wasteful in gas consumption in such intermittent applications. If one sq. ft. of a furnace wall, made up of composite materials of varying thicknesses, is taken and assumed to be in use in a furnace operating intermittently at 1,000°C., for ten hours of each working day, which includes heating up, it can be established by calculation that the thermal capacity and heat loss is as given in the following table:

TABLE 2

No.	Material	Junction temp. °C.	Outside temp. °C.	Heat loss B.Th.U. per hour	Thermal capacity	Total B.Th.U. 10 hours, including heat loss
1	6 in. S	—	110	460	4,800	8,480
2	4½ in. D by 4½ in. S	760	70	220	8,960	10,720
3	9 in. S	—	90	320	7,850	10,410
4	4½ in. S by 4½ in. F	860	110	490	22,320	25,750
5	4½ in. S by 9 in. F	770	100	420	38,620	41,140
6	4½ in. S by 13½ in. F	700	95	360	53,500	55,300

S Insulating refractory. F Firebrick. D Diatomaceous insulation.

If example No. 6 is considered in a hypothetical furnace with 20 square feet of internal surface, and the furnace assumed to be constructed with material as specified, i.e., 13 in. firebrick backed with 4½ in. of refractory, 18.6 therms are required over the ten hour period at 1,000°C., whereas a furnace of identical surface area, but constructed with a wall thickness as in example No. 1 with 6 in. of insulating refractory requires only 2.8 therms.

The saving quoted is, of course, maximum and assumes that the furnaces are cooled to room temperature, whereas in practice the one with the higher thermal capacity, assuming good damper control, might well be at 200 or 300°C. the following morning. However, even if an allowance of as high as 30% for this is made there is still a very appreciable saving. The other point which is often made, is that in ten hours the furnace with the thicker walls will not have reached equilibrium but, judged from the fuel consumption, the thermal capacity requirement is largely satisfied. Furthermore, as a 'tool' the furnace with the lower thermal capacity is much more responsive and will reach its temperature in a fraction of the time of its heavy counterpart.

This illustrates the importance of utilising insulating refractories for intermittent applications on the 'hot face' wherever practicable and this does much to consolidate and expand our industrial gas sales in the medium and high temperature furnace processes. Such an example, i.e., an empty furnace, when the saving is at a maximum, is perhaps rather striking, but even in a loaded furnace the saving is still as 'real,' although expressed as a percentage of the total heat input, it is smaller.

Complementary Factors

The complementary factors which contribute to 'optimum' efficiency must not be forgotten. These are, load and air recuperation, correct choice and disposition of burners, combustion chambers, flue ways and convection paths within the furnace structure. There is still considerable benefit to be derived from a study of 'flow patterns' in different types of furnace, which are helped by the streamlining of the flow, and elimination of 'resistance' spots causing eddying and re-

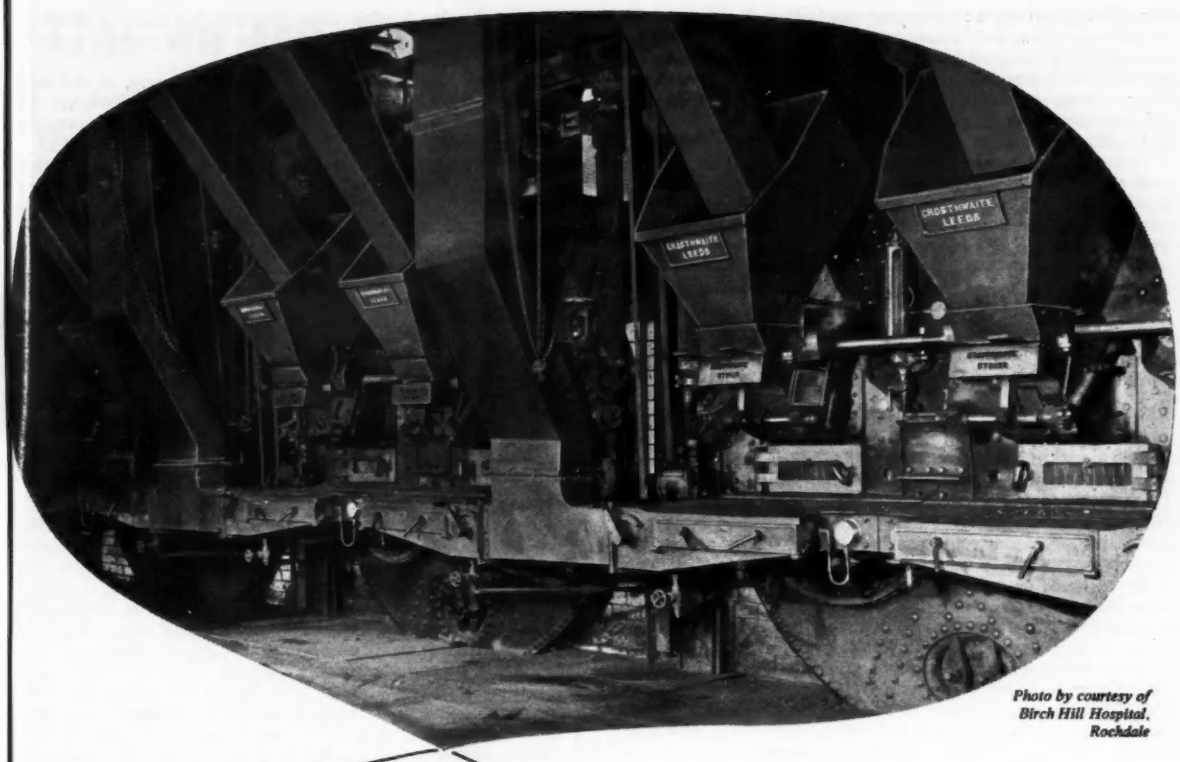


Photo by courtesy of Birch Hill Hospital, Rochdale

CLEAN, EFFICIENT and TROUBLE-FREE...

Crosthwaite Furnace Equipment is renowned for its efficiency, reliability and unusually long life. It is suitable for practically all types of boilers and burns all grades of solid fuel getting the maximum amount of heat from each.

CROSTHWAITE

FORCED DRAUGHT FURNACES, MECHANICAL STOKERS AND COAL & ASH HANDLING PLANT

Send for details

CROSTHWAITE FURNACES AND SCRIVEN MACHINE TOOLS LTD.

York Street Ironworks, LEEDS 9
Tel. 3-2411 & 2

32 Victoria Street, LONDON, S.W.1
Tel. ABBey 2966

circulation, and allows the employment of smaller flueways and higher velocities, with accompanying higher heat transfer.

Control of air:gas ratio by proportioning burner equipment also contributes much to the maintenance of optimum efficiency over a long period of service, while the general employment of pressure air burner systems has the advantage of reducing air infiltration into the furnace to a minimum.

Although the complexity of controls on furnaces and ovens today contribute to thermal efficiency and safety in operation, they can create problems of pressure loss, and there is a tendency on the part of manufacturers, consumers, and ourselves possibly to aggravate this by advocating controls that are too small in size to save capital outlay, but there is much to be said for 'erring' on the large size for all controls and for internal pipework.

Plant designed so as to require 4 or 5 in. W.G. at the inlet to the first control can often be a source of complaint when the inlet pressures are reduced to a figure approaching the statutory level of 2 in. W.G.

Experience during the war years clearly established that most industrial plant could be adjusted or designed to function efficiently on pressures as low as ½ in. W.G., and there is no doubt that the correct sizing of controls and pipe lines can contribute much to 'good consumer service.'

NEW BOOKS

BOILER HOUSE PRACTICE (*second edition*), *by J. N. Williams.*

pp. 624. George Allen & Unwin, Ltd. Price 60s.

When this book was published in 1953, it met a need among practical men for the scientific knowledge behind much of what they already knew. The boiler house executive, who has gone through a course of instruction, will understand better if he can be shown the background for the orders he receives when they seem different from the rule-of-thumb methods he may have employed in the past. The coke salesman, who is trying to influence industrial or commercial users in smokeless zones, will find this text book of great use to enable him to put over some important point which may sway the opinion of his potential customer. It will also be of great interest to students studying steam raising and boiler house technology, since the book is amply illustrated with line drawings, half tone reproductions, and graphs.

The new edition has been expanded from 600 to 624 pages and the more important additions and extensions include packaged steam generators, the stratification of gas flow, and the indirect method of boiler efficiency testing. The sections dealing with coal storage and over heating, and chimney emissions have been completely re-written.

STATISTICAL YEAR BOOK OF THE WORLD POWER CONFERENCE. Edited by Frederick Brown, B.Sc.(Econ.), F.S.S.

pp. 187. Peter Lund, Humphries & Co., Ltd. Price £3 3s.

In this edition, the statistics of the resources are the latest available and those of production, stocks, imports, exports and consumption relate to the years 1952, 1953, 1954, and where available 1955. Revised statistics for earlier years are shown in some cases.

The figures cover all types of fuels—solid, liquid, gaseous, water power and electricity—and have been supplied to the National Committees of the World Power Conference by the Government offices of the countries concerned.

The units of measurement used throughout the tables are metric but conversion factors for countries not accustomed to using the metric system can be found in the introduction. The tables are well and clearly laid out but it is disappointing to see that all the details which these tables offer have not been completely included in the returns by the different countries. This is particularly noticeable among some of the smaller European countries. This publication, in spite of this shortcoming, is a most useful reference book. The addenda and the bibliographical sections at the end of the book help to give an excellent overall picture of the world's fuel and power resources and yearly consumptions.

SAMUEL CUTLER & SONS LTD.

SPECIALISTS IN ALL TYPES OF GASWORKS PLANT AND STEEL CONSTRUCTIONAL WORK

70 VICTORIA STREET WESTMINSTER S.W.1.

PROVIDENCE IRON WORKS MILLWALL E. 14.

LONDON

Gas on the Continent

Abstracts from Recent Publications

Danish Water Heater Thermostat

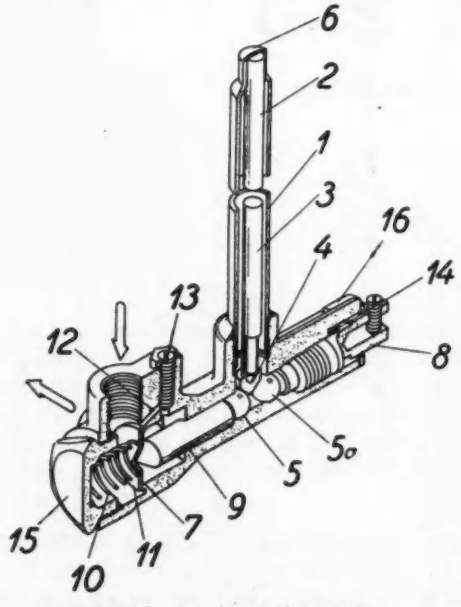
The Danish firm of Danfoss, at Nordborg, the well-known makers of thermostats for gas ovens, is now manufacturing rod thermostats on the same principle for water heaters and similar appliances. There are four varieties, with 13 cm. and 28 cm. feelers, and temperature ranges of 70°C. and 200°C., respectively. This implies that the thermostat can, for instance, be set to cover a range of from 30°C. to 100°C., or from 60°C. to 130°C., as desired.

The method of operation of the thermostat is shown in the diagram. The feeler rod consists of a brass tube (1) which contains a rod made of Invar steel (2) and brass (3). The steel rod is hard-soldered to the upper, narrowed end of the brass tube, and the brass rod to the steel rod. The part of the feeler with the brass rod may be regarded as 'insensitive.' The end of the brass rod carries a hard-chromed wedge (4) which transmits the feeler movements to ball thrusts 5 and 5a, which move at right angles to the feeler movement.

The wedge can be moved to and fro in the brass tube in the direction of movement of the ball thrusts, since the hard-soldering (6) acts as a pivot for the feeler rod. In order to maintain a pilot flame alight when the valve (7) is fully closed, there is a by-pass (12) adjustable by means of screw (13). This admits sufficient gas to keep the pilot flame burning.

When an oven fitted with the thermostat is cold, the valve (7) will stay open, as the spindle (8), the ball thrust (5a) and the wedge (4) are so adjusted that the ball thrust (5) and the pressure pin (9) have compressed the spring (10) and keep the valve plate (11) lifted off the seating.

Immediately the gas is turned on, it passes freely through the thermostat, and when it is lit, the oven temperature will rise. The brass tube (1), which has a high coefficient of expansion, will become longer and pull the Invar rod (2) which has a very low coefficient of expansion and therefore hardly changes in length. The brass rod (3) follows along with the wedge (4), and the spring (10) can now press the valve plate (11), the pressure pin (9) and the ball thrust (5) back against the wedge (4), which again is held close to the ball thrust (5a) by a spring and the valve will close as the oven temperature rises.



Danish water heater thermostat.

When the required temperature is reached it continues to rise very slightly, and the valve will close a little too much; the temperature drops again; but it will soon become steady and a state of equilibrium between the opening of the valve and the temperature will be arrived at.

When the temperature drops with falling gas pressure, calorific value, or owing to the oven door being opened, the brass tube will contract, and the wedge will be pressed down by the rod between the ball thrusts, which will open the valve by means of the pressure pin. Gas supply will increase, and the thermostat will restore the temperature.

If a higher oven temperature is then desired, the spindle (8) is turned to the right. It presses on the ball thrust (5a), forcing the wedge (4) to open the valve (7) more widely by means of the ball thrust (5) and pressure pin (9). An increased oven temperature is now necessary for the feeler to be able to press the wedge (4) back far enough for the valve to close sufficiently and the state of equilibrium to be reached.

Gasteknikeren. Vol. 46. No. 2. January 21, 1957.

Consolidation of Earth in Trenches

After refilling trenches for gas and water mains and consolidating the filling material by hand and mechanical tools, tests were made to investigate the effect of this action on the resistance of the pipes and their joints. An appropriate technique for the measurement was applied which established the depth of cover needed according to type of soil and employment of light or heavy consolidating tools. The main object was to provide a cover for the pipes which would not need renewing after settlement. As gas and the larger water pipes are frequently combined in one trench, a similar arrangement was made for the tests as shown in Fig. 1. It will be seen that the gas pipes have a lighter cover. The pipe material was cast iron or steel and spigot-and-socket joints and sleeve joints were used. The length tested was 30 m., and the pipe diameters were NW 300 or 100 with short branch connections of NW 40.

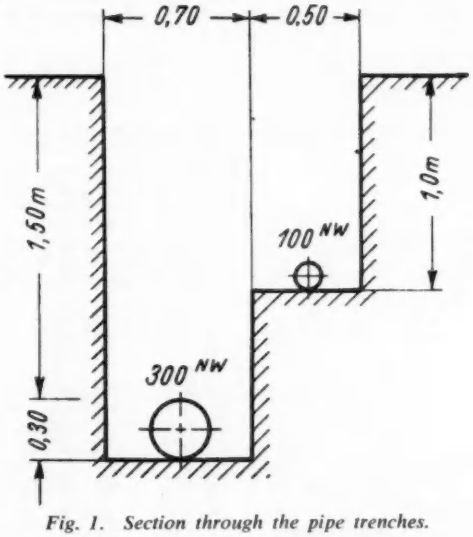


Fig. 1. Section through the pipe trenches.

Especial attention was given to the consolidation of the bottoms of the trenches. Then the sides and tops of the pipes were consolidated by hand operated wooden or iron stampers to a depth or width of 20 cm. After further filling, mechanical stampers of various types were used. During this work, heavy rain proved that the compression of the earth was adversely influenced by damp and that in some cases it would be even advisable to counteract this by adding dry material. Before inserting the pipes into the trenches, they were tested internally to 3 atm. pressure; for the purpose the joints were soaped. After the trenches had been completed, the internal pressure was controlled by manometer for a further 24 hours, after which the pipes were dug up, soaped again and examined for damaged points. With the steel tubes the wrapping was tested. In the various trenches, different stampers were used, according to the soil being back-filled and the efficiency of the stamping tool. After each layer of soil, the effect of the stamping was measured starting with the top of the pipes. This was done level by level. Test samples from the bottom soil, the loose

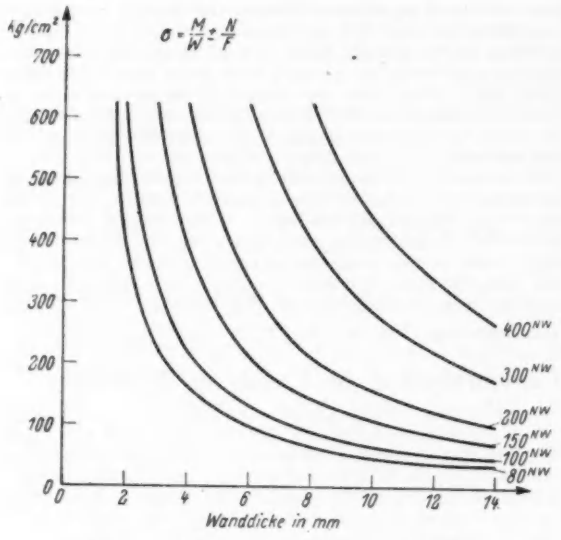


Fig. 2. Effect on the bottom of the pipes
Wanddichte . . . thickness of pipe wall in mm.

layers and the stamped layers were taken so that the required depth of the fill could be established in the laboratory. For each individual stamping machine the required depth of fill and its unconsolidated height were fixed. The pressure on the bottom of the tubes due to internal pressure, earth pressure and traffic pressure are shown in Fig. 2. For this purpose, an internal pressure of 10 atm. and a traffic pressure of 5,000 kg. with a 7 m. fill were assumed.

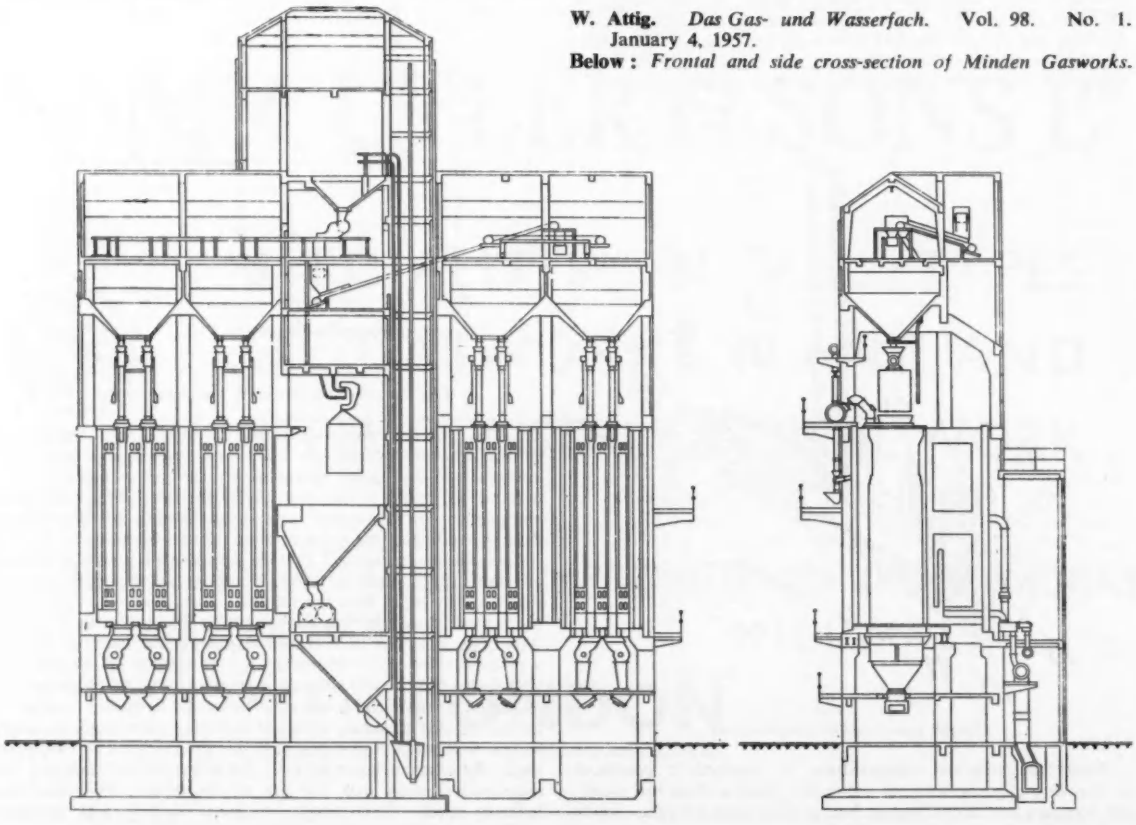
K. A. Delvendahl. *Das Gas- und Wasserfach.* Vol. 97. No. 19. October 1, 1956.

Continuous Vertical Gas Retorts

At the medium-sized Minden Gasworks in Germany where two new vertical retorts have been added to the two existing retorts, the feeding of the coal into the new plant is of interest. From the coal storage bunker the coal drops into intermediate bunkers which fit into the chamber and are closed during charging. As a result, all dust is avoided and the fresh coal immediately assumes the oven temperature. Another innovation claimed is that the method of withdrawal of the coke formed inside the chamber. This is done by means of a roller with square edges which withdraws the quenched coke steadily and continuously. The quenching of the coke and its resulting water gas production has the added advantage that the coke is free of dust when withdrawn and the water gas supply is steady. For these reasons, the working of the gasworks is especially clean and does not contaminate the air or inconvenience households within 100 m. of the works. The continuous movement of the charge has proved of especial advantage to the retort lining. This is improved after scurfing by blowing a fine mortar on to the walls which fills even the finest cracks and in a way glazes the surface. To show the resistance of the lining it is said that only after 16 years working was it found necessary to renew it. Other plants have shown even better results. A further advantage claimed is the flexibility of the gas make which can be easily varied from the low demand in the summer to the peak requirements in the winter. For the purpose all retorts are kept at work during all periods, the change being made in the heating supply of the retort. The output of gas can also be adjusted by the varying volatile content of the different types of coal charged. To be able to use coal from all sorts of sources a crushing mill has been erected in which the different varieties can be blended. Contrary to the general belief that the quality of coke produced by vertical retorts is inferior to that from periodically charged ovens, it was found that a correct mixture of the coal gave satisfactory results as to quality and quantity. The author recommends the vertical system for small and medium size gasworks, based on the results obtained in numerous German works and abroad.

W. Attig. *Das Gas- und Wasserfach.* Vol. 98. No. 1. January 4, 1957.

Below : *Frontal and side cross-section of Minden Gasworks.*



BUCKLERSBURY HOUSE TO STAND ON 3,500 BORED PILES

This important Office Building in the City of London, 17 storeys high including the basement floors, is supported on Cementation Bored Piles. Approximately 3,500 were constructed well within the contract time despite the fact that delays were unavoidably occasioned by the deliberations on the fate of the Mithras Temple discovered on the site and other major difficulties inevitable on such a large site.

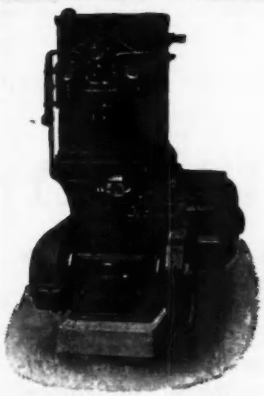
The construction of a surrounding wall to retain the adjoining Queen Victoria Street, Cannon Street and Bucklersbury was greatly facilitated by the use of our bored piles.

The close proximity of important buildings including the Mansion House and services such as the Underground Railway made it necessary to reduce noise, vibration, etc., to an absolute minimum.

The CEMENTATION COMPANY LIMITED

London Office: 20, Albert Embankment, S.E.11. Telephone: RELiance 7654

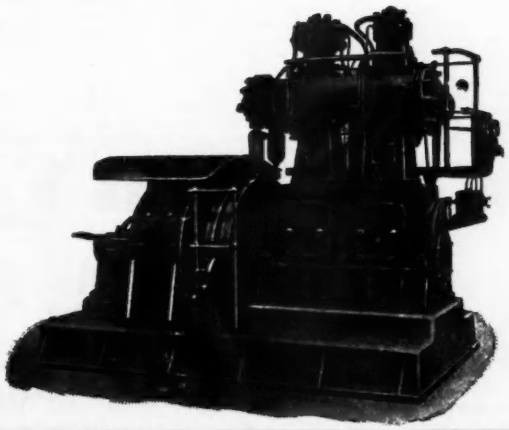
BENTLEY WORKS, DONCASTER. Tel: 54175-6-7-8-9



HIGH PRESSURE GAS COMPRESSORS for pressures up to 5,000 lbs. per sq. in.

The illustrations show two high pressure gas compressors. As specialists in the design and manufacture of compressors for both air and gases, we make compressors for a wide range of capacity and pressure up to 5000 lbs. per sq. inch.

The compressor shown above has a capacity of 25 cu. ft. of free hydrogen per minute compressed to 3000 lbs./sq. inch. The illustration on the right shows a four-stage compressor with a delivered capacity of 200 cu. ft. of free town's gas per minute compressed to 5000 lbs. per sq. inch.



For full information regarding gas compressors, write, giving particulars of the duty required, to—

REAVELL & CO., LTD.

RANELAGH WORKS, IPSWICH

Telegrams: "REAVELL, IPSWICH." Phone Nos. 2124 & 2125

A new idea for your Showroom!

Sell the cooker . . . sell the product to keep it looking new—always. That's the latest bright idea for cooker showrooms—an idea you could well put into action in your showroom. Customers will appreciate your advice and interest—and they'll appreciate Chemico, for it really does clean cookers inside and out so easily. And there are good profits to be made by selling Chemico. Interesting, isn't it? We'd be glad to tell you more about the scheme.

STOCK, SELL & RECOMMEND

CHEMICO

the all-purpose household cleanser
AS AN ADDED SERVICE TO YOUR CUSTOMERS.

CHEMICO
IS RECOMMENDED BY
GAS BOARDS
FOR CLEANING COOKERS

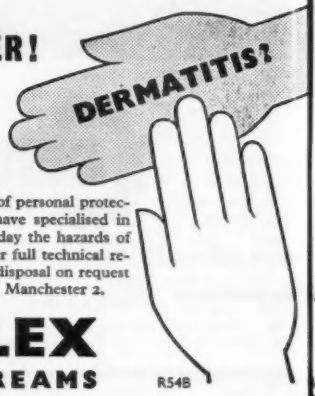
RETAIL PRICES
1/6 & 2/9
BULK SUPPLIES AVAILABLE

for further information write to
THE COUNTY CHEMICAL CO., LTD., SHIRLEY, SOLIHULL, WARWICKSHIRE.

CRANE

VALVES for Gas, Steam, Water, Oil and Air

PROTECTION IS THE ANSWER!



Dermatitis — or even the fear of dermatitis — can seriously impair the efficiency of an otherwise healthy labour force. Rozalex not only protects skilled hands against this risk, it also has a psychological value—giving the worker a feeling of personal protection. For over 25 years Rozalex have specialised in barrier creams for industry and today the hazards of every trade can be countered. Their full technical resources and experience are at *your* disposal on request to Rozalex Ltd., 10 Norfolk Street, Manchester 2.

ROZALEX
BARRIER CREAMS
R54B

SCIENTIFIC LUBRICATION
for the GAS INDUSTRY

Long years of experience enable us to offer a complete range of lubricants of the highest quality.

TECHNICAL SERVICES INCLUDE:—
Comprehensive Lubrication Surveys by Expert Lubrication Engineers and Chemists—without obligation.

Contracts on a Thermal Output Basis are available
Consult the leading suppliers to the Industry

CENTURY LUBRICANTS

WALKERS (CENTURY OILS) LTD.
CENTURY WORKS · HANLEY · STAFFS.

Telephone: Stoke-on-Trent 25203 (4 lines) *Telegrams:* Viscosity, Stoke-on-Trent

BRANCHES IN ALL PARTS OF THE COUNTRY

Contractors to the British Government, Crown Colonies, British Railways, National Coal Board, Area Gas Boards, Road Transport Executive, &c.

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/6d.; by post 1/8d.

Subscription Rates:—65/- per annum; (Payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area or inside pages 10 in. deep × 7 in. wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN & MIDLANDS REPRESENTATIVE: A. Engelhardt, T.D., 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: FLEet Street 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright. Highest prices paid for Spent Oxide.

Send your enquiries to

AS PURIFICATION LIMITED

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

...grams: ...rification, Stock, London." Telephone: London Wall 7938/9 & 7930

GAS ACCOUNT CALCULATORS

FOR ORDINARY OR PREPAYMENT METERS, ANY CALORIFIC VALUE, OFFICE SIZE OR POCKET CHARTS

ENQUIRIES INVITED

F. H. WAKELIN LTD. Calculator Specialists

354, WHEELER ST., BIRMINGHAM, 19

'PHONE NOR. 0989

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.

NATURAL BRITISH.

BOG (DUTCH and DANISH) ORE.

SPENT OXIDE.

LONDON ROAD, LEICESTER.

Telegrams: "BRIPURIMAT"

Telephone: 59086

FIRE!

WHERE'S YOUR

NU-SWIFT?

Details, please, of Nu-Swift rapid and reliable Fire Extinguishers— BEFORE IT IS TOO LATE!

Name.....

Address.....

Post NOW to Nu-Swift Ltd., Elland, Yorkshire

In Every Ship of the Royal Navy

"KLEENOFF" ★

THE COOKER CLEANER

"KLEENOFF"

FIBRE BRUSHES

RUBBER MOPS

"KAY-DEE" ★

KETTLE DESCALER

for resale to the public and in bulk for works use

BALE & CHURCH, LTD.

CROMPTON WAY, CRAWLEY, SUSSEX

PATENTS

KINGS PATENT AGENCY, LTD.

(Director, B. T. King, A.I.M.E., Patent Agent) Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

PLANT FOR SALE

SPECIAL OFFER: Large quantity of new cast iron fullway valves, all iron parts, 8 in., 10 in., 12 in. and 14 in. for sale. The Midland Iron & Hardware Co. (Cradley Heath) Ltd., Cradley Heath, Staffs. Tel.: Cradley Heath 6264 and 5.

FOR SALE: Pressure Vessels 30 ft. by 8 ft. 6 in. diameter for 100 lb. and 120 lb. pressure. Converted Lancashire Boilers. Cleckheaton Engineering Co. Ltd., Cleckheaton, Yorks. Phone 397.

APPOINTMENTS VACANT

NATIONAL COAL BOARD

NORTH EASTERN DIVISION

TECHNICAL ASSISTANT to the Mechanical Engineer required at Manvers Main Coking Plant, Wath-on-Dearne, Rotherham. Salary range £575 to £1,025 per annum.

Applicants must be fully conversant in the maintenance of modern coke oven and by-product plants. A recognised qualification in engineering is desirable.

Apply to Administrative Officer, N.C.B., N.E. Division, Carbonisation Department, Standfield House, Fulwood Road, Sheffield 10, by March 2. Please mark envelopes " Staff Vacancy."

SOUTH WESTERN GAS BOARD

BRISTOL/BATH DIVISION
APPOINTMENT OF TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT. The appointment will be graded A.P.T. 5, 6 or 7 (£575-£750) per annum, precise grade to be applied being dependent upon experience and qualifications.

The duties include Works supervision of all types, including Horizontal Retorts and Water Gas Plant.

Applications to be received by the undersigned not later than Saturday, March 2, 1957.

CHARLES R. INGHAM,
Production Engineer and Manager.

Radiant House,
Bristol, 1.

February 7, 1957.

SOUTH WESTERN GAS BOARD

SENIOR TECHNICAL ASSISTANT ON AREA SCIENTIFIC STAFF

APPLICATIONS are invited from qualified TECHNICAL ASSISTANTS and GAS WORKS CHEMISTS for the above vacancy.

The person appointed will be based at the Area Scientific Headquarters, Bristol, under the control of the Area Scientist, and will be required to visit Works in the Area for varying periods of time. The duties will consist primarily of working in co-operation with the Technical Staff at the Works being visited in connection with Retort House control, Fuel Efficiency, Purification, and other technical investigations which may be required. The possession of the Higher Grade Certificate of the Institution of Gas Engineering (Manufacture) or an equivalent Chemical qualification is necessary.

The salary for the post will be within Grade A.P.T. 10 of the Salary Scales of the National Joint Council for Gas Staffs (£820-£920 per annum) according to the experience and qualifications of the successful applicant.

The successful applicant will be required to pass a medical examination and to join the Board's Pension Scheme.

Applications, stating age, qualifications, and giving particulars of training and experience, together with the names and addresses of two referees, should be sent to the Area Scientist, South Western Gas Board, Area Scientific Headquarters. Cannon Marsh Gasworks, Bristol, 1, not later than March 16, 1957.

February 6, 1957.

(*Classified advertisements continued on page* 426

APPOINTMENTS VACANT (*ctd.*)

NORTHERN GAS BOARD

TEES-SIDE DIVISION

APPLICATIONS are invited for the position of FOREMAN MAIN and SERVICE LAYER at the Stockton Unit.

Applicants should be fully experienced in high and low pressure mainlaying and service laying.

The appointment is within Intermediate Grade 6 Conditions 2 (£550-£595). The successful candidate will be required to undergo a medical examination.

Applications stating age and experience, together with the names of two referees, should be addressed to the undersigned and received not later than February 25, 1957

JOHN W. PALLISTER,
Divisional General Manager.

G.P.O. Box No. 4,
Gas Works,
Commercial Street.
Middlesbrough,
Yorks.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION
DRAUGHTSMAN—
DIVISIONAL ENGINEER'S OFFICE

CANDIDATES should hold a Higher National Certificate in Civil or Mechanical Engineering or equivalent qualification and have had considerable experience in an Engineering Drawing Office, including plant layout; a knowledge of gas works plant will be an advantage but is not essential.

The salary will be within A.P.T. Grade 9 (£755 x 25—£855) of the National Salary Scales for Gas Staffs.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications, stating age, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham 3, to reach him not later than March 4, 1957.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

SALES AND SERVICE DEPARTMENT
ADVISER, CATERING EQUIPMENT

APPLICATIONS are invited for the above position, which will necessitate travelling throughout the West Midlands Area.

Candidates should possess an appropriate qualification in Domestic Science and have had experience in canteen work and be capable of advising on the use of all large scale gas equipment, carrying out practical cooking on consumers' premises, giving demonstrations to canteen personnel and have some knowledge of kitchen planning.

Ownership of, or ability to drive, a car would be an advantage.

The salary for the post will be within A.P.T. Grade 6 (£538-£608, rising to £690 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications, stating age, education, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham 15, to reach him not later than March 4, 1957.

J. C. INGRAM,
Secretary to the Board.

THE GAS COUNCIL

MIDLANDS RESEARCH STATION
VACANCY FOR
ANALYTICAL CHEMIST

THE newly-established research station is concerned with new methods of gas manufacture and with promoting the more efficient use of gas.

Candidates should be corporate members, by examination, of the Royal Institute of Chemistry and be experienced in the analysis and testing of solid and liquid fuels and gases.

The duties will include:—

Training and supervising the work of a small group of analysts.

Dealing with samples arising from experiments on gasification, hydrogenation, etc.

Undertaking special analytical investigations.

The salary offered will depend on qualifications and experience.

The station is in Solihull, a residential borough within easy reach of Birmingham, Stratford-upon-Avon, Warwick and Leamington Spa.

Candidates should write to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham 15, detailing their education, qualifications and experience. The Board administers the station on behalf of the Gas Council.

J. C. INGRAM,
Secretary, West Midlands Gas Board.

SCOTTISH GAS BOARD

EDINBURGH DIVISION
DIVISIONAL FINANCIAL AND
ADMINISTRATIVE OFFICER

APPLICATIONS are invited for the post of DIVISIONAL FINANCIAL AND ADMINISTRATIVE OFFICER at the Headquarters of the Edinburgh Division of the Board.

Applicants must have a recognised accountancy qualification together with sound experience of financial and accountancy organisation and the ability to direct and control a large staff. Experience of mechanised systems appropriate to a large public undertaking would be an added recommendation.

The commencing salary will be within Group F, £1,675-£1,925 per annum of the National Salaries Table for Senior Officers, with placing according to qualifications and experience.

The post is pensionable, and the successful applicant will be required to pass a medical examination.

Applications stating age and giving particulars of education, training, experience and qualifications, together with the names of two referees, should be addressed to the undersigned within fourteen days of the appearance of this advertisement.

A. T. HERD,
Secretary.

26, Drumsheugh Gardens
Edinburgh, 3.

February 13, 1957.

SCOTTISH GAS BOARD

ASSISTANT TO SUPERANNUATION OFFICER

APPLICATIONS are invited for the post of ASSISTANT TO THE SUPERANNUATION OFFICER in the Financial Department at Board Headquarters in Edinburgh. Applicants should have a good educational background and have some knowledge of the administration of pension schemes. Commencing salary will be dependent on qualifications and experience but will not be less than £750 per annum.

The post is pensionable, and the successful applicant will be required to pass a medical examination.

Applications stating age and giving particulars of education, training, experience and qualifications, together with the names of two referees, should be addressed to the undersigned within fourteen days of the appearance of this advertisement.

A. T. HERD,
Secretary.

26, Drumsheugh Gardens
Edinburgh, 3.

February 13, 1957.

TAR RESIDUALS LTD. require SALESM[AN] experienced coal tar products, techni[cal] qualifications an advantage. Apply to Plant ti[me] House, Mincing Lane, London, E.C.3.

SHIFT SUPERVISORS required for Co[ke] Carbonisation and By-Product Recovery Pla[nt] near Chesterfield. Applicants should ha[ve] experience of control of all types of labour a[nd] knowledge of steam raising and gas producer plan[t] Previous experience on similar Works a[n] advantage. Concessionary fuel allowance is g[iv]e Write in first instance giving particulars of a[ge] experience and salary expected, to No. 312, *G[as] Journal*, 11, Bolt Court, Fleet Street, London, E.C[.4]

ASSISTANT required for brasswork develop[ment] section of domestic cooking and heating appli[ance] manufacturers. Engineering/physics background a[nd] previous development experience desirable. Ap[ply] stating age, experience and salary required to t[he] Technical Staff Appointments Officer, Radiation, Ltd[.] Thimblemill Lane, Aston, Birmingham, 6.

KING'S MANUAL
OF
GAS MANUFACTURE
SECTION 7a

Gas Cooling
and
Tar Fog Removal

by

Charles Cooper, M.Sc., M.Inst.Gas.E., M.I.Chem.E., and James J. Priestley, M.Sc., M.Inst.Gas.E., A.M.I.Chem.E.
(W. C. Holmes & Co., Ltd.)

PRICE
Inc. 15/- *postage*

WALTER KING, LTD.
11 BOLT COURT
FLEET STREET · LONDON, E.C.4

STRINGER BROTHERS
ALBION WEST BROMWICH

S.B
IRON & STEEL
PLATES &
SHEETS
BARS & SECTIONS
Telephone:
WEST BROMWICH 0436-7

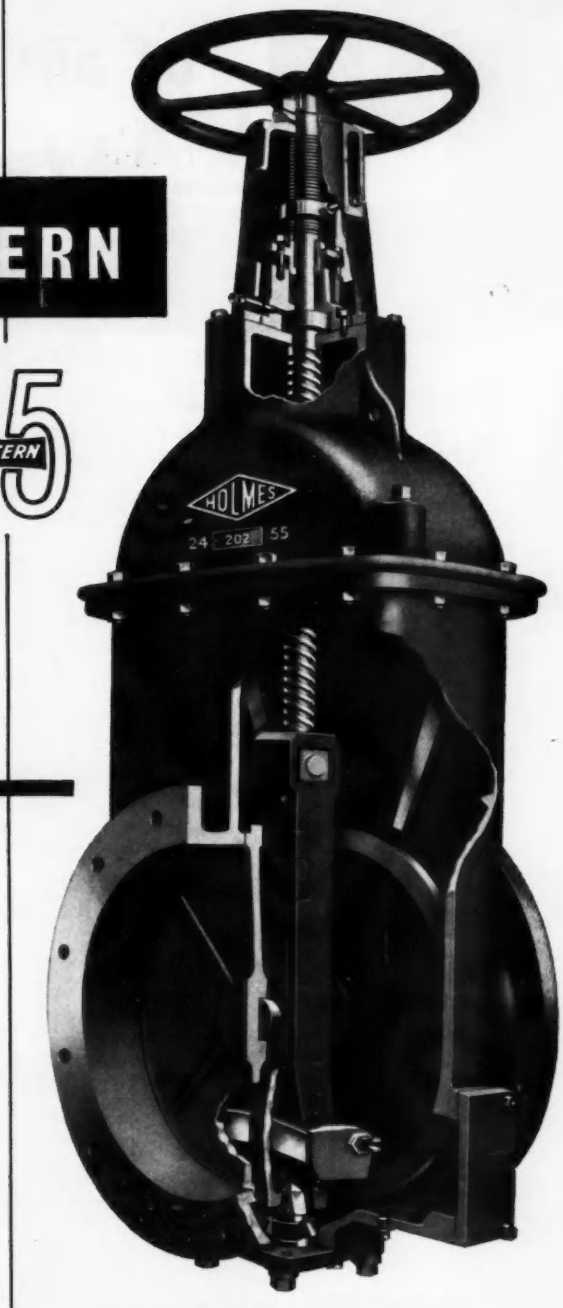
Specify

HOLMES-WESTERN

Valves

55 PATTERN

The Holmes-Western Valve is of the double disc parallel slide type and has been specifically designed for the Gas and Coking Industries.



British Patent No. 758253.

Holmes-Western Valve.
Type 203 - 12" 'Horizontal'
without indicator.

Write for copy of Publication No. 52/5

W. C. HOLMES & CO. LTD

HUDDERSFIELD · LONDON · BIRMINGHAM
Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6830

TYPE 3 MIXTURE CONTROLLER

for accurate control of air blast systems

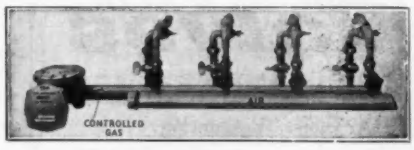
The Type 3 is the latest development in mixture controllers. Its function ensures exact proportioning of air and gas over a wide range of volumes despite the slightest variation of pressures.

Air pressures between ¼ lb. and 1 lb. are used normally but in special instances up to 2 lb. can be used.

Of robust unit construction, the assembly consists of a diaphragm valve, monitor governor and an injector which can be set in any one of four standard positions on site.

The Type 3 mixture controller is available in four sizes 1", 1¼", 1½" and 2". Write or 'phone now for particulars.

The Type 3 zero governor is a modification of the controller. Providing individual control of burners, it gives greater effective control of heat distribution, facilitates burner ignition and has greater sensitivity and range than previous types.



INDUSTRIAL GAS EQUIPMENT

Keith Blackman Ltd
MILL MEAD ROAD, LONDON, N.17
TEL: TOTTENHAM 4522 (12 LINES)

If air blast arrangements are not already installed a K.B. High Pressure fan will provide, as a rule, greater efficiency and economy than a positive blower or compressor of equal capacity. These fans may be supplied with or without K.B. made motors as required.

601

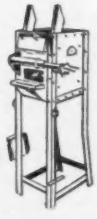
BRITISH ALCOSA PRODUCTS

P.F. 040 FURNACE

The Ideal Gas-fired Toolroom Furnace for heat treatment or brazing of small parts. Conversion from Furnace to Brazing Hearth in a few minutes. Complete with Motorised Blower. Extensively used in Technical Colleges.

B.2183 BRASS STAMPING FURNACE

A highly efficient gas-fired Furnace supplied to world markets with great satisfaction. Suitable for working with Presses from 60-250 tons. Also made for use with propane and calor gas.



LEADERS IN INDUSTRIAL GAS EQUIPMENT

A.H.WILKES & CO.

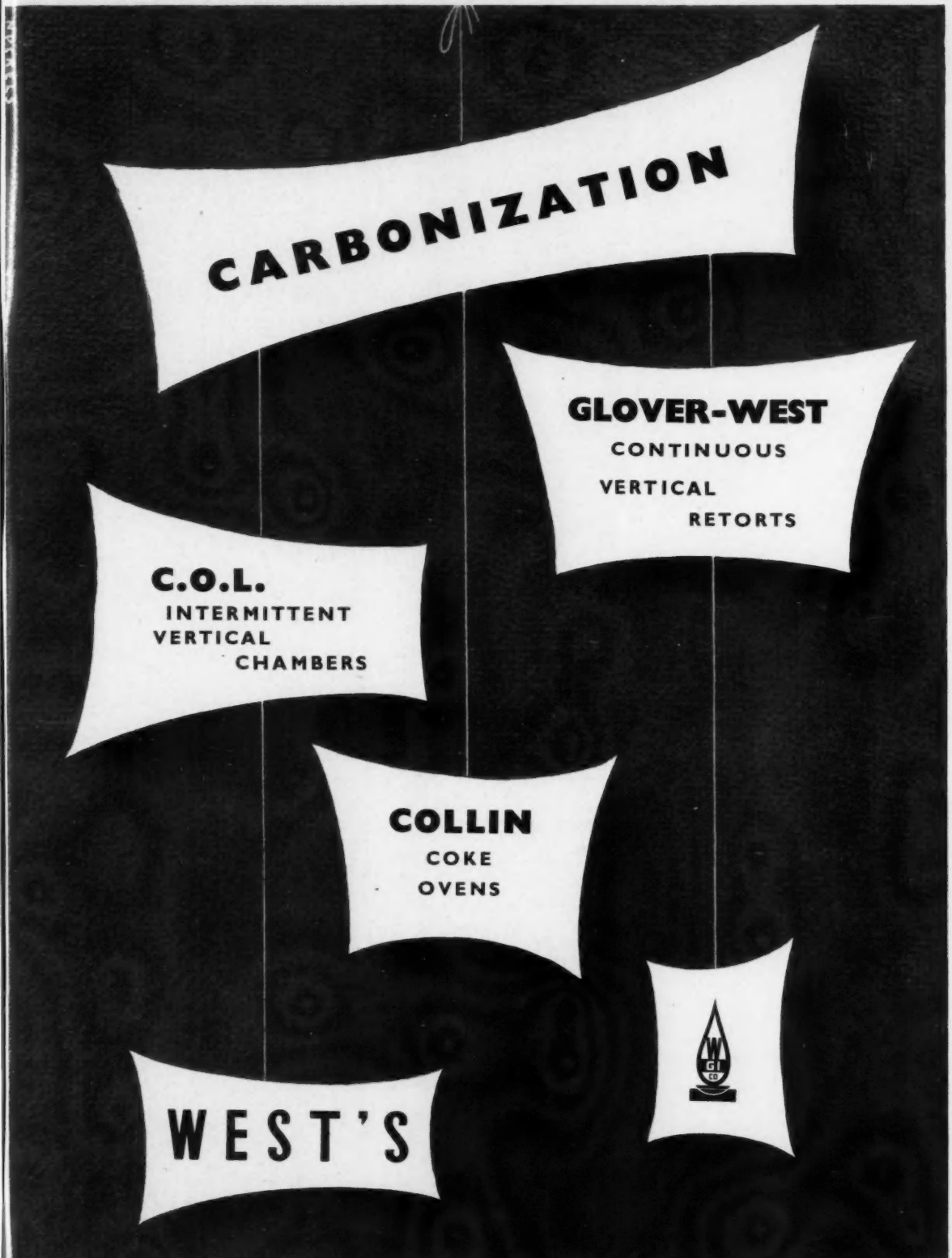
(A Subsidiary of William Allday & Co., Ltd.)

Head Office and Works:
"Alcosa" Works, Stourport-on-Severn, Worcestershire
Telephone: Stourport 2311-4 Telegrams: Yadall, Stourport
London Office: **158 Birchanger Rd, South Norwood, S.E.25**
Tel. Addiscombe 1162 and 1295

OTHER "ALCOSA" PRODUCTS INCLUDE:

BLOWERS, BRAZING EQUIPMENT, GAS & OIL BURNERS, FURNACES, SOLDERING & TINSMITHS EQUIPMENT, POSITIVE PRESSURE BLOWERS AND FANS, HIGH & LOW PRESSURES FOR ALL PURPOSES.

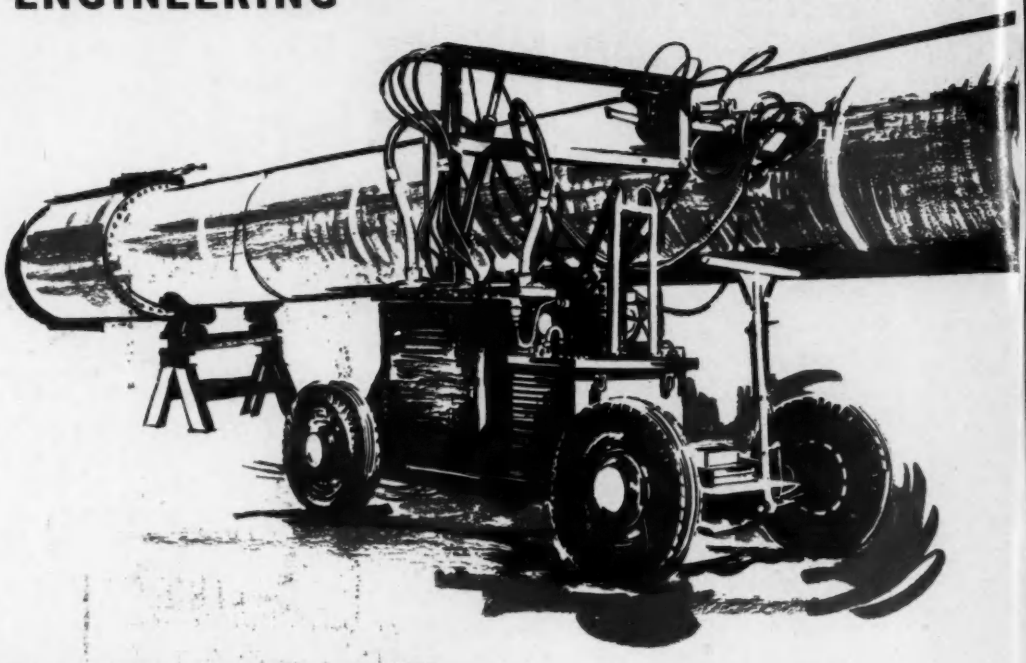
Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4., Wednesday, February 20, 1957



WEST'S GAS IMPROVEMENT COMPANY LIMITED · *MILES PLATTING, MANCHESTER 10*
Telephone: COLlyhurst 2961 Telegrams: Stoker, Manchester
London: Columbia House, Aldwych, W.C.2. Tel.: HOL 4108 C.O.L. Div: Chandos House, Buckingham Gate, S.W.1. Tel.: ABB 6912

C.4

LEADERS IN FIELD ENGINEERING



This self-contained mobile radiographic unit is able to travel to any site for the critical examination of welded vessels, pipework, structures, etc. Within a short time of the radiographic examination being completed the film can be processed in the unit's darkroom, dried and examined. It makes available on hire, facilities to those sections of the engineering industry which find that the maintenance of a permanent radiographic department would not be an economic proposition. Write for descriptive brochure.

Illustration above:—
A 300 kV X-ray unit being used to examine a spiral-guided welded gasholder

Illustration below:—
The air-conditioned darkroom is provided with hot and cold running water and electricity is supplied by the unit's separate generating set

THE POWER-GAS CORPORATION LIMITED
AND
ASHMORE, BENSON, PEASE & COMPANY
STOCKTON-ON-TEES AND LONDON
AUSTRALIA • CANADA • FRANCE • INDIA • SOUTH AFRICA